CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Probability & Statistics

(Civil Engineering)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Define Classical definition of Probability.	1 M
2.	State Baye's theorem.	1 M
3.	Formulate covariance of a random variable.	1 M
4.	State Chebyshve's theorem.	1 M
5.	Define Binomial distribution.	1 M
6.	State central limit theorem.	1 M
7.	Formulate confidence interval.	1 M
8.	Define type-I error, type-II error.	1 M
9.	Define rank correlation.	1 M
10.	Define regression lines.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). A sample of 4 items is selected at random from a box containing 12 items of which 5 are defective. Calculate the expected number of defective items.   10M

OR

11. B). Companies B_1, B_2, B_3 produce 30%, 45% and 25% of the cars respectively. It is known that 2%, 3% and 2% of the cars produced from B_1, B_2 and B_3 are defective.   10M
i) Compute the Probability that a car purchased is defective?
ii) If a car purchased is found to be defective what is the Probability that this car is produced by company B_3.

12. A). i) A random variable X is uniformly distributed on the interval (-5,15). Another random variable $Y=e^{\frac{-x}{5}}$ is formed. What is the expected vcalue of Y?   5M
ii) If a random variable has a Poisson distribution such that   5M
P(X=1) = P(X=2). Calculate a) mean   b)P(X=4)   c) P(1 < X < 4)

OR

12. B). A random variable X has the following probability function: 10M

x	0	1	2	3	4	5	6	7
$p(x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$

i) Find the value of the k ii) Evaluate $P(X < 6), P(X \geq 6)$ iii) $P(0 < X < 5)$.

(P.T.O..)

13. A). For the continuous probability function $f(x) = k x^2 e^{-x}$, when $x \geq 0$, compute   10M
i) k ii) Mean iii) Variance.

<center>OR</center>

13. B). To examine the hypothesis that the husbands are more intelligent than wives, an   10M
investigator took a sample of 10 couples and administered them a test which measure the
I.Q. The results are as follows:
Test the hypothesis with a reasonable test at the level of significance of 0.05.

Husbands	117	105	97	105	123	109	86	78	103	107
Wives	106	98	87	104	116	95	90	69	108	85

14. A). A sample of 400 items is taken from a population whose standard deviation is 10. The   10M
mean of the sample is 40. Test whether the sample has come from a population with mean
38. Also calculate 95% confidence interval for the population.

<center>OR</center>

14. B). i) Write the procedure for testing of Hypothesis.   5M

ii) In a big city 325 men out of 600 men were found to be smokers. Does this information   5M
support the conclusion that the majority of men in this city are smokers?

15. A). i) Explain types of Correlation.   5M
ii) By the method of least squares fit a parabola of the form $y = a + bx + cx^2$ for the   5M
following data.

X	2	4	6	8	10
Y	3.07	12.85	31.47	57.38	91.29

<center>OR</center>

15. B). In a partially destroyed laboratory record of an analysis of correlation data , the following   10M
results are only eligible:
Variance of X = 9. Regression Equations:
$8X - 10Y + 66 = 0$, $40X - 18Y = 214$.
What were
i) The mean values of X and Y

ii) The correlation coefficient between X and Y

iii) Standard deviation of Y

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Strenght of Materials-II
(Civil Engineering)

Date: 19.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1.	Expression for Deflection of a close – coiled helical spring.	1 M
2.	What is torsional rigidity?	1 M
3.	Define equivalent length of a column.	1 M
4.	Expression for Crippling stress.	1 M
5.	List out the checks for stability.	1 M
6.	Explain maximum and minimum stresses in a Chimney.	1 M
7.	Write expressions for Lame's equations.	1 M
8.	Discuss the assumptions made in Lame's theory.	1 M
9.	Define principal plane.	1 M
10.	Define shear center.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). A Close coiled helical spring is of 4cm mean diameter of spring and wire diameter of 5mm subjected to a load of 500 N having 15 no. of turns and take Modulus of rigidity is 85GPa. Calculate Maximum deflection of the spring.   **10M**

OR

11. B). i) Explain the assumptions made in the theory of pure torsion?   **5M**
ii) Derive the complete torsion equation and explain all the seven terms.   **5M**

12. A). Derive an expression for crippling load when both the ends of the column are fixed.   **10M**

OR

12. B). i) Explain types of springs with neat sketches.   **5M**
ii) Differentiate Short columns and long columns of columns.   **5M**

13. A). A concrete dam has its upstream face vertical and a top width of 3 m. Its downstream face has a uniform batter. It stores water to a depth of 15 m with a free board of 2 m. The weights of water and concrete may be taken as 10 KN/m3 and 25 KN/m3. Calculate the minimum dam width at the bottom for no tension in concrete, neglect uplift.   **10M**

OR

13. B). A masonry retaining wall of trapezoidal section is 12m high and retains earth which is level up to the top. The width at the top is 3m and at the bottom is 6m and exposed face is vertical. Find the maximum and minimum intensities of normal stress at the base. Take density of wall=1600 Kg/m^3 and density of masonry=2300 Kg/m^3 and angle of repose of the earth=30^0.   **10M**

(P.T.O..)

14. A). A cylindrical vessel is 2m diameter, 6m long and is closed at the ends by rigid plates. It is subjected to an internal pressure of 3.50 N/mm^2. If the maximum principal stress is not to exceed 150 N/mm^2, Find the thickness of the shell. Assume E = 2×10^5 N/mm^2 and Poisson's ratio μ = 0.25. Find the changes in diameter, length.   10M

OR

14. B). A Cylinder of 400mm internal diameter and 100mm thickness contains a fluid at a pressure of 100 N/mm^2. Find the maximum and minimum hoop stress across the section. Also sketch the radial and hoop stress distribution across the section.   10M

15. A). Derive about deflection of a beam under unsymmetrical bending.   10M

OR

15. B). An equal angle section of 80X80X10 mm is used as a simply supported beam over a span of 2.4 m. It carries a load of 400 N along the line YG, where G is the centroid of the section. Calculate the deflection of the beam at the mid-section and its direction with the load line   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Hydraulics and Hydraulics Machinery
(Civil Engineering)

Date: 22.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1. What is the relation between Chezy's C and Manning's n .   1 M
2. Define critical depth.   1 M
3. Classify various channel bottom slopes.   1 M
4. Discuss the types of surges.   1 M
5. Evaluate the force exerted by a jet of water when a jet of diameter 10mm strikes a flat stationery plate with a velocity of 15 m / sec at center of plate.   1 M
6. Explain the statement of angular momentum principle.   1 M
7. Discuss Layout of a typical Hydropower installation.   1 M
8. Identify various components of Francis Turbine.   1 M
9. Elaborate the term NPSH.   1 M
10. What do you understand by reciprocating pump?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). Derive the conditions for most economical trapezoidal channel section.   10M

OR

11. B). i) Formulate the equation of Chezy's from basics of uniform flow with assumptions.   5M
ii) Determine the dimension of the section if it is most economical when a trapezoidal channel has side slopes of 1 horizontal to 2 vertical and the slope of the bed is 1 in 1000. The area of the section is 42m². Also determine the discharge of the most economical section if C=60.   5M

12. A). i) Explain M1 and S2 type GVF profiles with sketches.   5M
ii) Analyze the slope of free water surface when a discharge of water 86.4 m³ /sec is flowing through rectangular channel of width 24m and depth of flow of 6m. Consider bed slope of channel as 1 in 4000. Take Chezy's coefficient as 60.   5M

OR

12. B). i) Discuss the sequential steps to be followed in analyzing a particular profile using direct step method.   5M
ii). Analyze and examine the formation of Hydraulic jump with the data given below. Width 3m, discharge 7.5 Cumecs velocity 5 m/sec. If it forms find the height, length and energy loss .   5M

(P.T.O..)

13. A). i) Distinguish between Geometric, kinematic and dynamic similarities with their equations. 5M

ii) Develop an expression for R when the resistance R is experienced by a partially submerged body depends upon the velocity V, length L, viscosity μ, density ρ and acceleration due to gravity g. Use Buckingham $\prod$ method. 5M

OR

13. B). A jet of water of diameter 20mm strikes a 200mm X 200mm square plate of unifo thickness with a velocity of 10m/sec at the center of the plate which is suspended vertica by a hinge on its top horizontal edge. The weight of plate is 98 N and the jet strikes normal the plate. 10M

i) What force must be applied at the lower edge of the plate so that plate is kept vertical .

ii) If the plate is allowed to deflect freely, what will be the inclination of the plate w vertical due to the force exerted by jet of water.

14. A). i) Distinguish between impulse turbines and reaction turbines. 5M

ii). Evaluate the volume flow rate, power developed and hydraulic efficiency when a reaction turbine works at 450 RPM under a head of 120m. Its diameter at inlet is 1.2 m and the flow area is 0.4 m^2. The angles made by absolute and relative velocities at inlet are 20^0 and 60^0 respectively with the tangential velocity. 5M

OR

14. B). Explain the importance of the various characteristic curves of turbines. 10M

15. A). i). Explain the term negative slip used with reciprocating pump. Why and when negative sli occurs? 5M

ii) Find the diameter and width of impeller of a centrifugal pump which runs at 1000RPM, the outlet vane angle is 45^0 and flow velocity at outlet is 2.5 m/sec. The discharge through pump is 200 Litres/sec .The pump is working against a head of 20m.The manometric efficiency is 80 %. 5M

OR

15. B). Find the height from water surface at which a centrifugal pump may be installed in the following case to avoid cavitation. 10M

Atmospheric pressure = 1.01 Bar, vapour pressure = 0.022 Bar, inlet and other losses in suction pipe = 1.42 m, effective head of pump = 49 m and cavitation parameter = 0.115.(5M)

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Concrete Technology
(Civil Engineering)

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	List the different sieve sizes for fine aggregates.	1 M
2.	Define Fineness modulus.	1 M
3.	Define Workability.	1 M
4.	Distinguish between segregation and bleeding.	1 M
5.	List the non-destructive testing methods.	1 M
6.	What is meant by maturity of concrete?	1 M
7.	What is dynamic modulus of elasticity?	1 M
8.	Recall the reasons for shrinkage of concrete.	1 M
9.	Define admixture.	1 M
10.	Define Mix Design.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). What is grading? Explain the significance of grading of aggregates.   10M

OR

11. B). Explain the different properties of recycled aggregate.   10M

12. A). List and explain the factors affecting the workability of concrete.   10M

OR

12. B). Explain different steps involved in the manufacturing of concrete.   10M

13. A). Explain the procedure of conducting Rebound hammer test.   10M

OR

13. B). Discuss in detail about the tests on compression strength, and flexure strength of concrete.   10M

14. A). Explain briefly different types of shrinkage.   10M

OR

14. B). Discuss the beneficial and harmful effects of creep of concrete.   10M

15. A). Explain various types of admixtures in detail.   10M

OR

15. B). Determine mix design for M30 grade concrete using BIS method for the following data. 16 M Specific gravity of cement = 3.12 Specific gravity of fine aggregate = 2.62 Specific gravity of coarse aggregate = 2.72 Fineness modulus of fine aggregate = 2.3 (Zone III sand) Fineness modulus of coarse aggregate = 6.9 Condition of exposure =Severe Workability in terms of slump = 150 mm Assume any necessary data suitable.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Structural Analysis-I

(Civil Engineering)

Date: 26.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.   **10x1=10M**

1.	What is perfect frame?	1 M
2.	When do you prefer method of sections for analysis of trusses?	1 M
3.	Define Castigliano's first theorem.	1 M
4.	Write the expression of strain energy due to bending moment.	1 M
5.	What do you understand by the term prop?	1 M
6.	What are the advantages of fixed beams?	1 M
7.	State Claypeyron's Three Moment theorem.	1 M
8.	Define slope deflection method.	1 M
9.	Draw the influence diagram for a shear force at any section of a simply supported beam?	1 M
10.	Define the influence line.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A).   Analyse the truss shown in **Fig. 1**, using method of joints.   10M
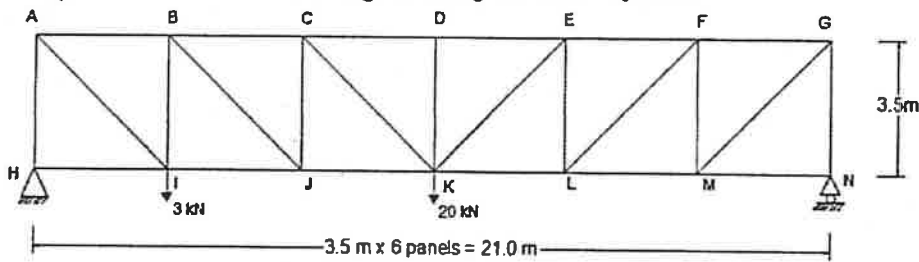
Fig. 1

OR

11. B).   Analyse the above truss, shown in **Fig. 1**, using tension coefficient method.   10M

12. A).   Define Strain energy. Derive an expression for strain energy due to bending moment.   10M

OR

12. B).   Derive Castigliano's first theorem.   10M

13. A).   A cantilever of length 8m carries a uniformly distributed load of 4 kN/m length over the whole length. The free end of the cantilever is supported on a prop. If $E = 2\times10^5$ N/ mm^2 and I=10^8 mm^4, then (i) find the prop reaction (ii) Magnitude and position of maximum deflection.   10M

OR

13. B).   Find the fixed end moments for a fixed beam of span 8 m subjected to a concentrated clockwise moment of 12 kNm at 2.5 m from the right end.   10M

(P.T.O..)

14. A). Derive of propped cantilever with point load and udl.   10M

OR

14. B). A Continuous beam is fixed at A and is supported over rollers at B and C. AB=BC= 12 m.   10M
The beam carries a uniformly distributed load of 30 kN/m over AB and a point load of 240 kN at a distance of 4 m from B on span BC. B has a settlement of 30 mm. $E = 2 \times 10^5$ N/mm^2, $I = 2 \times 10^9$ mm^4. Analyze the beam by slope deflection method.

15. A). Two wheel loads of 50 kN and 30 kN spaced 4 m apart cross a girder of 20 m span, with   10M
30 kN load leading from left to right. Draw influence lines for shear force and bending moment and also find maximum +ve, -ve shear force and bending moment at 7 m from the left support.

OR

15. B). Construct influence lines for members BC, BD, CD, BE and AC of the Pratt shown in   10M
Fig. 2. Also find forces in the members BC and CI, using influence lines, when 10 kN load acts joint D.
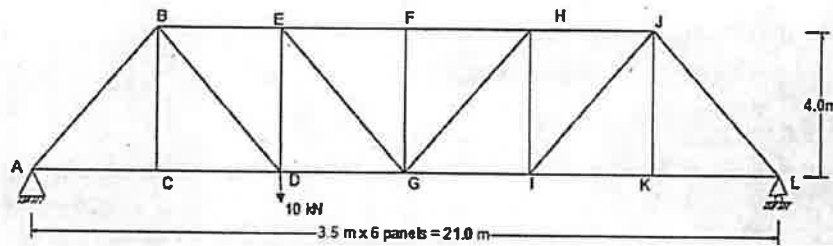
Fig. 2

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Fluid Mechanics & Hydraulic Machinery
(Electrical & Electronics Engineering)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1. Define Viscosity and what are the types of viscosity.   1 M
2. What are the units of surface tension?   1 M
3. What is continuity equation?   1 M
4. What are the practical applications of Bernoulli's equation?   1 M
5. Explain how laminar and turbulent boundary layers are formed.   1 M
6. Explain the working principle of Orifice meter.   1 M
7. Define Reynolds number.   1 M
8. Explain about cavitation in turbines.   1 M
9. What is priming of a centrifugal pump? Why it is needed?   1 M
10. Define slip of reciprocating pump.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). Describe the differential manometer with neat sketch.   10M

OR

11. B). The right limb of a simple U- tube manometer containing mercury is open to the   10M
atmosphere while the left limb is connected to a pipe in which a fluid of sp.gr. 0.9 is
flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. Find
the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20
cm.

12. A). A pipe of diameter 200 mm conveys a discharge of 2250 litres of water per minute and   10M
has a pressure of 15.70 kPa at a certain section. Find the total energy head with respect to
a datum of 5 metres below the pipe.

OR

12. B). Derive Bernoulli's equation through Euler's equation of motion.   10M

13. A). A pipe carrying water has a 30 cm × 15 cm of diameters main and the throat and the Cd   10M
of the meter is 0.98. A differential U-tube manometer with mercury as indicating fluid is
connected to the inlet and to the throat and shows a differential column height of 30 cm
calculate i) the discharge in the pipe ii) if the pressure in the inlet section is 50 k Pa,
determine the pressure at the throat iii) Find the head loss in the converging section of the
Venturimeter.

(P.T.O..)

OR

13. B). What is a Venturi meter? And explain about venturi meter with neat sketch and derive 10M
expression for discharge through venturimeter.

14. A). Show that for the maximum efficiency, the bucket speed of a pelton wheel should be 10M
equal to one half of the jet speed.

OR

14. B). A hydraulic turbine under a head of 25 metres develops 7260 kW running at 110 rpm. 10M
What is the specific speed of the turbine? What type of turbine is this? Find also the
normal speed and output if the head on the turbine is reduced to 20 metres.

15. A). Define a centrifugal pump. Explain the working of a single-stage centrifugal pump with 10M
sketches.

OR

15. B). The internal and external diameters of the impeller of a centrifugal pump are 200 mm and 10M
400 mm respectively. The pump is running at 1200 r.p.m. The vane angles of the impeller
at inlet and outlet are 20 ^{0} and 30 ^{0} respectively. The water enters the impeller radially and
velocity of flow is constant. Determine the work done by the impeller per unit weight of
water.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Electrical Machines-II
(Electrical & Electronics Engineering)

Date: 19.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1. Write the differences between transformer and induction motor.   1 M
2. Define slip.   1 M
3. What happens to maximum torque with change in rotor resistance in induction motor?   1 M
4. Define induction generator.   1 M
5. Why the air gap is kept non-uniform in Salient Pole Synchronous Machine?   1 M
6. Show the Load characteristics of a Synchronous Generator at different power factors.   1 M
7. A salient pole synchronous motor is running at no load. Explain what will happen if its field 1 M
   current is switched off?
8. What is synchronous condenser   1 M
9. Write the applications of single phase induction motor   1 M
10. Explain why a single-phase induction motor is not self starting?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). Develop an expression for rotor current, rotor emf and p.f of a 3-phase induction motor at   10M
       standstill and running conditions.

OR

11. B). A 6 pole, 50 Hz, 3-Phase induction motor running on full load develops a useful torque of   10M
        160 N-m. When the rotor emf makes 120 complete cycle per minute. Calculate the shaft
        power input. Also, if the mechanical torque lost in friction and that for core loss is 10 N-
        m. Compute (i) The copper loss in the rotor windings. (ii) The input to the motor. (iii) The
        efficiency. The total stator loss in given to be 800 W.

12. A). Derive an expression for the torque developed in a 3-phase induction motor and the   10M
        condition for maximum torque. Also explain the torque slip characteristics of IM.

OR

12. B). Determine the starting torque of a 3-phase induction motor in terms of full load torque   10M
        when started by means of:
        (i) Star delta starter; and (ii) An auto-transformer starter with 50% tapings. The motor
        draws a starting current of 5 times the full load current when started direct on line. The
        full load slip is 4 percent.

13. A). A 3-phase, 20-pole, 360 rpm, star connected alternator has a double-layer winding   10M
        arranged in 180 slots. There are 6- conductors per slot. Find the emf induced per phase, if
        the flux per pole is 0.042 Wb. The coils are short-chorded by one slot.

(P.T.O..)

OR

13. B). Explain clearly what is meant by synchronous impedance of an alternator and how it can   10M
be determined experimentally. How does the value of regulation as calculated by
synchronous impedance method compared with that obtained from an actual load test.

14. A). Explain any two methods of synchronizing an alternator with the bus-bar.   10M

OR

14. B). Explain the variation of current and power factor of a synchronous motor with excitation.   10M

15. A). Explain with suitable diagram the working principle of Split- phase and Capacitor start   10M
induction motor.

OR

15. B). Discuss about the working of universal motor using relevant diagrams.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Measurements and Instrumentation
(Electrical & Electronics Engineering)

Date: 22.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	List out the types of principles in secondary instruments.	1 M
2.	What is the purpose of damping torque?	1 M
3.	Define transformation ratio.	1 M
4.	What is the importance of standard cell in DC Crompton potentiometer?	1 M
5.	State creeping error in energy meter.	1 M
6.	What are the main two coils in wattmeter?	1 M
7.	Define the sensitivity galvanometer.	1 M
8.	What is the importance of Meggar circuit?	1 M
9.	Define Transducer.	1 M
10.	What is piezoelectric effect?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Draw and explain the operation of MI attraction type instrument with neat sketch.   10M

OR

11. B). i) List out the errors present in MI type instruments and how to compensate errors?   5M
ii) What is the value of shunt resistance required to convert a galvanometer of resistance 100Ω into an ammeter of range 1A? Full scale deflection of the galvanometer is 5 mA.   5M

12. A). How to construct a current transformer and also explain its operation?   10M

OR

12. B). State standardization and explain how to measure the unknown resistance using Crompton's DC potentiometer with standard cell.   10M

13. A). Derive the expression for power factor angle in two wattmeter method for measurement of power.   10M

OR

13. B). Describe the constructional features and operation of electro-dynamometer wattmeter.   10M

14. A). Describe the HAY'S bridge and also measure the unknown self-inductance   10M

OR

14. B). How to balance a bridge and also measure unknown resistance using wheatstone bridge.   10M

15. A). i) Define transducer and discuss different types of transducers.   7M
ii) List out applications of LVDT.   3M

OR

15. B). List out parts of CRO and also explain the constructional details and working of CRT.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Power Systems-II
(Electrical & Electronics Engineering)

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. Define different types of transmission lines.   1 M
2. What is the power factor angle of the load for maximum voltage regulation?   1 M
3. Define Sag and Tension.   1 M
4. What is capacitance grading?   1 M
5. Write the refraction and reflection voltage coefficient of T-junction line.   1 M
6. What are the different voltage control methods?   1 M
7. Write the maximum power transfer equation for symmetrical line.   1 M
8. Draw the impedance diagram of an alternator.   1 M
9. Draw the sequence network of LL fault.   1 M
10. What are effects of unsymmetrical faults on the power system?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Derive the equivalent circuit representation of long transmission line, ABCD constants   10M
and efficiency and regulation.

OR

11. B). Derive the equation of Critical disruptive voltage, corona loss and what are the factors   10M
effecting the corona loss.

12. A). Explain about potential distribution of suspension insulator string and derive expression   10M
for string efficiency.

OR

12. B). Calculation of Sag for (i)When supports are at equal levels and (ii)When supports are at   10M
unequal levels.

13. A). Explain briefly about different voltage control methods.   10M

OR

13. B). i) Explain briefly about the shunt and series compensation of transmission systems.   5M
ii) Discuss the phenomenon of wave Reflection & Refraction. Derive the expression for   5M
Reflection & Refraction coefficients of Open circuited& Short circuited line.

14. A). i) Write short notes on compensated and un-compensated transmission lines.   10M
ii) Explain about Load compensation.

(P.T.O..)

<div align="center">**OR**</div>

14. B).   i) Explain single line, impedance and reactance diagrams of different equipment's used in power systems?   7M

       ii) A single phase two winding transformer is rated 20 KVA, 480/120 V at 50 HZ. The equivalent leakage impedance of the transformer referred to LV side is $0.0525\angle 78.13°$ ohm using transformer ratings as base values, determine the per unit leakage impedance referred to the HV side and LV side.   3M

15. A).   Derive an expression for the fault current for LG Fault at the terminals of an unloaded Generator? Also draw the sequence Network.   10M

<div align="center">**OR**</div>

15. B).   Three 100MVA generators each having a reactance of 0.2 pu are operating in parallel. They feed a transmission line through 300 MVA transformer having a per unit reactance of 0.05 pu. Find Fault current for a fault at the sending end of the line.   10M

<div align="center">*********</div>

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Switching Theory & Logic Design
(Common for EEE & ECE)

Date: 26.07.2024 AN | Time: 3 hours | Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark. 10x1=10M

1. How are negative number indicate? 1 M
2. What are the applications of Gray code? 1 M
3. How many variables do a 2-square and 4-square eliminate? 1 M
4. Why is a multiplexer called a data selector? 1 M
5. What is meant by clocked flip flop? 1 M
6. Define SR Latch. 1 M
7. What is a serial in, parallel out shift register? 1 M
8. What is a BCD counter? 1 M
9. What do you mean by initial state and final state? 1 M
10. What is the Moore model of the state diagram of a memory element? 1 M

PART-B
Answer the following. Each question carries TEN Marks. 5x10=50M

11.A). Multiply the following hexadecimal numbers 10M
i)28A×B   ii)5A9B×7   iii)92.5×B.3

OR

11. B). i) Realization of Ex-OR gate using NAND gate. 5M
ii) Convert Binary number 1010 to gray code. 5M

12. A). Obtain the minimal expression using the tabular method and implement it in universal 10M
gates. F = $\sum m(0,1,3,4,5,6,7,13,15)$

OR

12. B). Draw a logic diagram for a 2421 to decimal decoder? 10M

13. A). Distinguish between combinational and sequential logic circuits? Find the characteristic 10M
equation for T flip flop?

OR

13. B). Convert the T- flip flop into: 10M
i)SR FF   ii)J-K FF

14. A). Design a synchronous counter to generate the sequence 0,1,2,3,5,8 and repeat the 10M
sequence using T flip-flops

OR

14. B). Design and explain the operation of Bi-directional shift register. 10M

15. A). Explain the procedure of state minimization using the partition technique. 10M

OR

15. B). What is the Moore and Mealy machines? Compare them. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Probability, Statistics & Complex Variables
(Mechanical Engineering)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. Find the probability to get the alphabet 'i' from the vowels.   1 M
2. Two dice are thrown simultaneously. Let X denotes the "Min. of two numbers appear" then find its Discrete probability distribution.   1 M
3. If the probability that an individual suffers a bad reaction due to certain injection is 0.001. Determine the probability that out of 2000 individuals exactly 3 individual suffer a bad reaction.   1 M
4. Write any two characteristics of Normal distribution.   1 M
5. Write difference of two mean formula.   1 M
6. Define Null and Alternate Hypothesis.   1 M
7. Prove that the function $u(x, y) = x^2 - y^2 - y$ is harmonic.   1 M
8. Write Cauchy-Riemann equations in polar form.   1 M
9. Find the zeros of the function $\left(\dfrac{z+1}{z^2+1} \right)^2$.   1 M
10. State Cauchy's integral theorem.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) A random variable X has the following distribution   5M

X=x	-3	-2	-1	0	1	2
P(X=x)	K	0.1	K	0.2	2k	0.4

Find the value of K and Mean of a random variable.

ii) Find the constant 'k' such that $f(x) = \begin{cases} kx^2, & 0 < x < 3 \\ 0, & otherwise \end{cases}$ 5M

Determine $(a)\ k$ $(b) P(1 < X \le 2)$

OR

11. B). State Bayes Theorem.   10M
Box 1 contains 2 white and 3 black balls, Box 2 contains 4 white and 3 black balls and Box 3 contains 3 white and 7 black balls. One of the box is selected at random. One ball is drawn at random, it is found to be white ball. Find the probability that white ball is drawn from second box.

(P.T.O..)

12. A). i) The probability that the life of a bulb in 100 days is 0.05.Find the probability that out of   5M
6 bulbs (a) At least one (b) greater than four (c) None will be having a life of 100 days.

ii) If the mean of the a poisson distribution is 1.8 then find a) P(X>1)   b) P(X = 5)   5M
c) P (0<X<5)

OR

12. B). i) The income tax 'X' of a man has an exponential distribution with p.d.f. is given by   5M

$$f(x) = \begin{cases} \frac{1}{4}e^{-\frac{x}{4}}, & x \geq 0 \\ 0, & x < 0 \end{cases}$$

If income tax is levied at the rate of 5%. What is the probability that his income exceed
10,000.

ii) The length of time a person speaks over phone follows exponential distribution with   5M
parameter $= \frac{1}{4}$. What is the probability that the person will take for (i) More than 8
minutes (ii) between 4 and 8 minutes.

13. A). i) A random sample of size 100 has a standard deviation of 5. What can you say about the   5M
maximum error with 95% confidence.

ii) The efficiency expert of a computer company tested 40 engineers to estimate the   5M
average time to assemble a certain computer component, getting a mean of 12.73 min. and
S.D. of 2.06 min. then construct 98% confidence interval for the true average time it takes
to do the job.

OR

13. B). Random samples of 400 men and 600 women were asked where they would like to have a   10M
flyover near their residence. 200 men and 325 women for in the flyover for proposal. Test
the hypothesis that proposition of men and women in favor of the proposal are same at 5%
level.

14. A). Construct the analytic function whose real part is $u = e^{2x}(x\cos 2y - y\sin 2y)$ 10M

OR

14. B).
If f(z) is a regular function of z, P.T $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right)|f(z)|^2 = 4|f'(z)|^2$ 10M

15. A). Using Cauchy's integral formula, evaluate: 10M

$$\int_c \frac{z\,dz}{(z+i)(9-z^2)} \text{ where c is } |z|=2$$

OR

15. B). Expand the Laurent series of $f(z) = \frac{1}{z^2-3z+2}$ in the region (i) 0<|z-1|<1 (ii)1<|z|<2   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: IC Engines & Gas Turbines
(Mechanical Engineering)

Date: 19.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Classification of IC Engines.	1 M
2.	What is equivalence ratio?	1 M
3.	What is homogeneous mixture?	1 M
4.	What are different types of combustion chambers?	1 M
5.	What is brake thermal efficiency?	1 M
6.	What is the effect of clearance volume in reciprocating compressors?	1 M
7.	What is slip factor?	1 M
8.	What is polytropic efficiency of compressor?	1 M
9.	Define work ratio.	1 M
10.	Give the Applications of gas turbine plants.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). With the help of neat sketches, explain the working of a four stroke SI engine.   10M

OR

11. B). Explain briefly with neat sketch about fuel injection system and multi point fuel injection system.   10M

12. A). What is meant by flame front propagation? Explain the factors influencing flame speed and discuss the factors affecting knock in CI engines.   10M

OR

12. B). What are the various types of combustion chambers used in SI engines? Explain them briefly.   10M

13. A). The following data and results refer to a test on a single-cylinder, two stroke cycle engine: I_{mep}=550kpa, Cylinder diameter=21cm, piston stroke=28cm, engine speed=360rpm, brake torque=628Nm, fuel Consumption = 8.16kg/hr, calorific value = 42700kj/kg. Calculate: i) mechanical efficiency ii) Indicated thermal efficiency iii) brake thermal efficiency iv) brake-specific fuel consumption in kg/kwh.   10M

OR

13. B). Discuss the effect of clearance volume upon the performance of a reciprocating compressor. Also derive expression for work done with clearance.   10M

(P.T.O..)

14. A). The centrifugal compressor running at 10000rpm delivers 660m³/min of free air. The air   10M
is compressed from 1 bar and 20⁰C to a pressure ratio of 4 with an isentropic efficiency of
82%, blades are radial at outlet of impeller and flow velocity of 62m/s may be assumed
throughout constant. The outer radius of impeller is twice the inner and slip factor may be
assumed as 0.9. The blade area coefficient may be assumed 0.9 at inlet. Calculate: final
temperature of air, theoretical power, impeller diameters at inlet and outlet, impeller blade
angle at inlet, diffuser blade angle at inlet.

OR

14. B). Explain with neat sketch the working of axial flow compressor with velocity diagrams   10M
and derive equation for work done.

15. A). Explain the working of open cycle gas turbine plant with neat sketch and draw its T-S   10M
diagram and obtain expression for thermal efficiency, compressor efficiency and turbine
efficiency.

OR

15. B). A gas turbine unit has a pressure ratio of 6:1 and maximum cycle temperature of 610^0 C.   10M
The Isentropic efficiencies of the compressor and turbine are 0.8 and 0.82 respectively.
Calculate the power output in kW when the air enters the compressor at 15^0 C at the rate
of 16 kg/s. Take c_p=1.005 kJ/kgK and γ=1.4 for compression process and c_p=1.11 kJ/kgK
and γ=1.33 for expansion process.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Instrumentation & Control Systems
(Mechanical Engineering)

Date: 22.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Define Accuracy.	1 M
2.	Write the significance of measurement in our day-to-day life.	1 M
3.	Name any one material used for piezo electric transducers.	1 M
4.	Mention the significance of radiation pyrometers.	1 M
5.	Write about flow visualization.	1 M
6.	Name any one direct and indirect liquid level measuring devices.	1 M
7.	List the main advantage of semiconductor strain gauges.	1 M
8.	Define dew point temperature.	1 M
9.	List the elements of the control system.	1 M
10.	Label the difference between open loop and closed loop system.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). What are the different sources of errors in measurements and measuring instruments? Explain them.   10M

OR

11. B). Explain the basic principle of working of piezo-electric transducers.   10M

12. A). Draw a neat sketch to show the essential parts of a Bourdon tube pressure gauge. Describe the purpose of each part.   10M

OR

12. B). Explain the working of radiation pyrometer and write the sources of errors.   10M

13. A). Explain with a neat sketch the working of vibrometer.   10M

OR

13. B). Discuss the construction and working of hot wire anemometer.   10M

14. A). Explain the principle of working of electrical strain gauge.   10M

OR

14. B). Write short note on the following with neat sketches: 10M
i) Absorption psychrometer; ii) Dew point meter.

15. A). Write advantages and disadvantages of open loop and closed loop control systems.   10M

OR

15. B). Explain with the help of a block diagram the working of the position control systems. State its applications.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Manufacturing Processes
(Mechanical Engineering)

Date: 24.07.2024 AN | Time: 3 hours | Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.
10x1=10M

1.	Why is casting suitable for making complex shapes?	1 M
2.	Discuss the pouring time for a casting metal with a suitable example.	1 M
3.	What is the characteristic of a neutral flame?	1 M
4.	What is the main principle behind spot welding?	1 M
5.	What is the purpose of using inert gases in welding?	1 M
6.	How does laser welding differ from arc welding?	1 M
7.	How does hot working affect the grain structure of metals?	1 M
8.	How does friction affect the rolling process?	1 M
9.	What is the difference between hot extrusion and cold extrusion?	1 M
10.	How does temperature affect forging parameters?	1 M

PART-B
Answer the following. Each question carries TEN Marks.
5x10=50M

11.A). Discuss the advantages and disadvantages of casting as a manufacturing process. Provide examples of applications where casting is preferred over other manufacturing methods. | 10M

OR

11. B). Describe the investment casting process. Explain the steps involved, the advantages and limitations of investment casting, and provide examples of its applications. | 10M

12. A). Explain the different types of welds and welded joints, including their characteristics and typical applications. Use diagrams where necessary. | 10M

OR

12. B). Explain the principles and applications of resistance welding processes. Discuss the factors that influence weld quality and the types of materials suitable for resistance welding. | 10M

13. A). Describe the TIG welding process in detail. Discuss the equipment used, shielding gases, electrode materials, and typical applications. | 10M

OR

13. B). Discuss common welding defects, their causes, and remedial measures. Provide examples of defects such as porosity, lack of fusion, cracking, and distortion, and explain how these defects impact weld quality and integrity. | 10M

(P.T.O..)

14. A). Explain Exemplify the processes of recovery, recrystallization, and grain growth in metals. Explain the conditions under which each process occurs, their effects on material properties, and their significance in metalworking.   10M

OR

14. B). Discuss the fundamentals and theory of rolling in metalworking. Explain the principle of rolling. Discuss the forces involved in rolling and the factors affecting rolling power requirements.   10M

15. A). Explain impact extrusion, including its process, equipment, and materials used. Discuss the advantages and typical applications of impact extrusion in the manufacturing industry.   10M

OR

15. B). Describe the principle of explosive forming. Discuss the advantages, limitations, and typical applications of explosive forming in the automation industry.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Kinematics of Machinery
(Mechanical Engineering)

Date: 26.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
**Each question carries ONE mark.**   **10x1=10M**

1. Explain the term Mechanism.   1 M
2. Define open pair.   1 M
3. What is kinematics?   1 M
4. How do you determine the direction of coriolis component of acceleration?   1 M
5. What is straight line motion mechanism?   1 M
6. Explain correct steering condition.   1 M
7. Define the term pressure angle for a cam mechanism.   1 M
8. What is follower?   1 M
9. Explain the term Higher pair.   1 M
10. Define law of gearing.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). Explain different types of constrained motion.   10M

OR

11. B). What are the inversions of mechanism? Sketch the inversions of slider crank chain and name the mechanisms obtained.   10M

12. A). Explain the procedure to construct Klein's construction to determine the velocity and acceleration of a slider-crank mechanism   10M

OR

12. B). In the mechanism, as shown in Fig., the crank OA rotates at 20 r.p.m. Anti clockwise and gives motion to the sliding blocks B and D. The dimensions of the various links are OA=300 mm, AB=1200 mm, BC=450 mm and CD=450 mm. for the given configuration determine i) Velocities of sliding at B and D ii) Angular velocity of CD iii) Linear acceleration of D iv) angular acceleration of CD.   10M
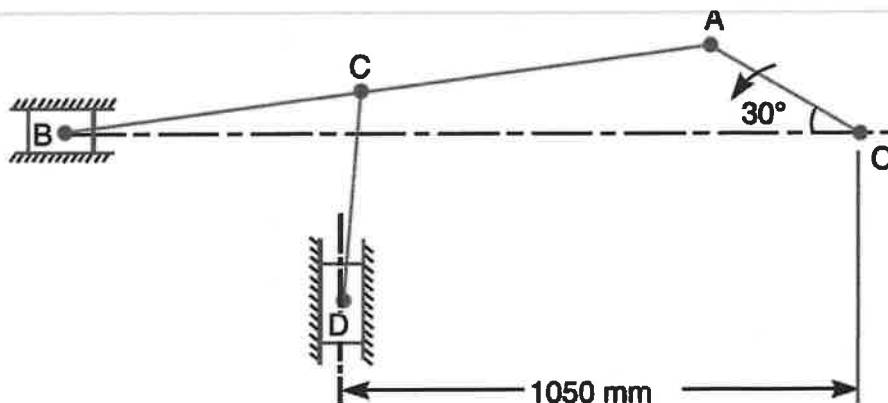
(P.T.O..)

13. A). Show that the pantograph can produce paths exactly similar to the ones traced out by a point on a link on an enlarged or a reduced scale   10M

OR

13. B). Two shafts are connected by a Hooke's joint. The driving shaft revolves uniformly at 500rpm. If the total permissible variation in speed of a driven shaft is not to exceed ± 6% of the mean speed, find the greatest permissible angle between the center lines of the shafts. Also determine the maximum and minimum speeds of the driven shaft.   10M

14. A). Deduce expressions for the velocity and acceleration of the follower when it moves with simple harmonic motion   10M

OR

14. B). A cam is to be designed for a knife wedge follower: i) Outside stroke doing 60^0 of cam rotation ii) Dwell for next 30^0 of cam rotation iii) return stroke for next 60^0 of cam rotation iv) dwell for remaining 210^0 of cam rotation. The stroke of the follower is 40mm and minimum radius of cam is 50mm. The follower moves with uniform velocity during both out stroke and return strokes. Draw the profile of cam when the axis of follower passes through axis of cam shaft.   10M

15. A). A pinion having 30 teeth drives a gear having 80 teeth. The profile of the gears is involute with 20^0 pressure angle, 12 mm module and 10mm addendum. Find the length of path of contact, arc of contact and contact ratio.   10M

OR

15. B). Two 20* involute spur gears mesh externally and give a velocity ratio of 3. The module is 3 mm and the addendum is equal to 1.1 module. If the pinion rotates at 120rpm, determine the (i) minimum number of teeth on each wheel to avoid interference (ii) contact ratio.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Linear and Digital IC Applications
(Electronics & Communication Engineering)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. Draw Op-amp equivalent circuit.   1 M
2. List the advantages of Integrated circuit.   1 M
3. Write the applications of PLL.   1 M
4. Write the applications of 555 timer in monostable mode.   1 M
5. What are the applications of ADC?   1 M
6. An 8 bit D/A converter as a resolution of 8mV/bit. Determine the analog output voltage for the input 10111010?   1 M
7. Which IC is used as BCD code converter?   1 M
8. Draw the pin diagram of IC 74XX138.   1 M
9. How to convert JK flip-flop to D flip flop?   1 M
10. What are the disadvantages of Dynamic RAM?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). With neat diagram, explain the operation of instrumentation amplifier using 741 op-amp and derive the expression for voltage gain.   10M

OR

11. B). Discuss the working of practical differentiator circuit. Derive the expression for output voltage.   10M

12. A). With a neat diagram, explain the operation of 555 Timer in monostable mode and derive the expression for pulse width.   10M

OR

12. B). Design a first order high pass filter with a cutoff frequency of 1.5 kHz, and a pass band gain of 3?   10M

13. A). With a neat diagram explain about the successive approximation type ADC in detail?   10M

OR

13. B). Consider a 10 bit D/A converter having a reference voltage of 10 V. What is the binary digital input needed to get 4.5 V output? What outputs are obtained from the converter for the inputs of (i) binary 0010110101 and (ii) decimal 520?   10M

14. A). With neat circuit diagram explain the working of a 4-bit odd parity generator.   10M

OR

14. B). Design 16×1 multiplexer using 4×1 multiplexers and 2 to 4 decoder.   10M

15. A). Explain different types of shift registers.   10M

OR

15. B). Explain in detail about read and write operations of SRAM.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Electronic Circuit Analysis
(Electronics & Communication Engineering)

Date: 19.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
**Each question carries ONE mark.**   **10x1=10M**

1.	How do you bias the transistor in class A operation?	1 M
2.	State the advantage of complementary symmetry class B amplifier.	1 M
3.	Define the Q – factor in tuned circuits.	1 M
4.	Mention the advantages and disadvantages of tuned amplifiers.	1 M
5.	List the two methods of triggering for bistable multivibrators?	1 M
6.	How a Schmitt trigger is different from a multivibrator?	1 M
7.	Name the different errors in generation of sweep waveforms.	1 M
8.	What is restoration time or flyback time?	1 M
9.	What is the purpose of synchronization?	1 M
10.	Write the limitations of sampling gate.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). i) Prove that the maximum efficiency of transformer coupled Class A power amplifier is 50%.   5M

ii) Calculate the input power, output power, and efficiency of the amplifier circuit in below figure for an input voltage that results in a base current of 10 mA peak.   5M
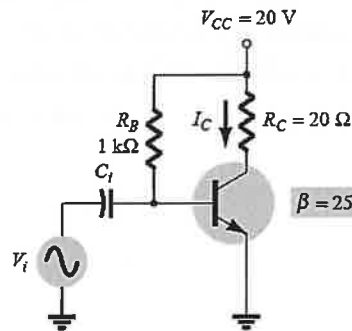
OR

11. B). i) With neat diagram explain Push Pull Class B Power Amplifier and derive its maximum efficiency.   6M

ii) Explain the working principle of Class D Power amplifier.   4M

12. A). i) Derive the expression for the 3dB bandwidth of a capacitance coupled single tuned amplifier.   6M

ii) Compare single and double tuned amplifiers.   4M

(P.T.O..)

<div align="center">OR</div>

12. B).   i) Obtain the expression for quality factor of a double tuned amplifier.   6M

         ii) Explain the concept of stagger tuning.   4M

13. A).   Design a collector-coupled monostable multivibrator shown in below figure to obtain a   10M
pulse of amplitude 10 V. Given that $I_C(sat) = 10$ mA, $I_{B2} = 2I_{B2}(min)$, $V_{CE}(sat) = 0.1$ V,
$V_{BE}(sat) = 0.3$ V, $h_{FE}(min) = 40$ and a pulse of duration 1000 μs is required. $V_{BE}(cut\text{-}off) =$
-1 V.
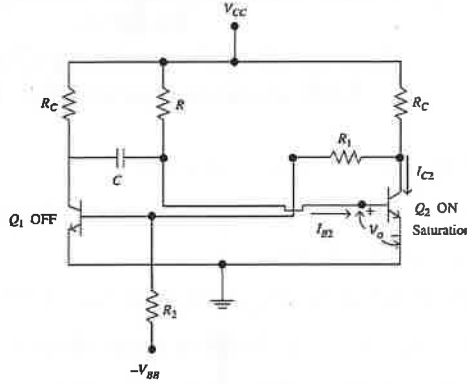
<div align="center">OR</div>

13. B).   Draw the circuit of a Schmitt trigger and explain its operation. Derive the expressions for   10M
(i) UTP and (ii) LTP.

14. A).   i) State the general features of a time base signal.   4M

         ii) Demonstrate the working of a transistor bootstrap time base generator.   6M

<div align="center">OR</div>

14. B).   i) Illustrate the working principle of Transistor Miller sweep circuit.   5M

         ii) Explain the techniques for improving the linearity in current sweeps.   5M

15. A).   i) Compare sine wave synchronization with pulse synchronization.   4M

         ii) With the help of neat diagram explain the working of a four-diode sampling gate.   6M

<div align="center">OR</div>

15. B).   i) Explain the synchronization of sweep circuit with symmetric signals.   5M

         ii) Discuss the reduction of pedestal in gate circuits.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Analog & Digital Communications
(Electronics & Communication Engineering)

Date: 22.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. What is the need for modulation?   1 M
2. Why is COSTAS loop used?   1 M
3. A single tone FM equation is described by   1 M
   $S(t) = 12\cos(6 \times 10^8 t + 10 \sin 3000\pi t)$ Determine the modulation Index and modulating signal frequency of the FM wave?
4. Mention any two demodulation methods of FM.   1 M
5. What is image frequency?   1 M
6. Draw the circuit diagrams of Pre emphasis and De-emphasis.   1 M
7. If the number of quantization levels in a PCM system are 512, then how many number of bits are required to represent each level.   1 M
8. Define quantization error.   1 M
9. Draw FSK signal for the binary data 100110101.   1 M
10. Define Inter Symbol Interference.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Define modulation and explain the necessity of modulation in communication system?   5M
   ii) A modulating signal of $2\cos5000\pi t$ is amplitude modulated over a carrier signal of $5\cos20000\pi t$. Derive expressions for the modulation index, LSB and USB frequencies, Bandwidth and the ratio of Side Band Power in the total Power of AM wave.   5M

OR

11. B). i) Explain the generation of SSB-SC signals by phase shift method with the help of neat block diagram?   5M
   ii) Explain coherent demodulation of DSBSC wave with the help of neat block diagram?   5M

12. A). i) Explain how FM signals can be generated using Armstrong method with an example.   5M
   ii) With is neat block diagram, explain how PLL can be used as a FM Demodulator.   5M

OR

12. B). i) Compare FM with AM in detail?   5M
   ii) What is the bandwidth required for an FM wave in which the modulating signal frequency is 10KHz and the maximum frequency deviation is 75 KHz?   5M

(P.T.O..)

13. A).	With the help of a neat block diagram explain the operation of FM transmitter. Explain each block in detail?	10M

OR

13. B).	What are the limitations of TRF Receiver and explain how these limitations are overcome by super heterodyne receiver?	10M

14. A).	i) Explain the PCM system with a neat block diagram.	5M
	ii) The PCM system uses uniform quantizer followed by a 7 bit binary encoder. The bit rate of the PCM system is equal to 50 Mbps. Find the maximum message bandwidth for which system operates satisfactorily.	5M

OR

14. B).	i) Discuss the generation and detection techniques of pulse width modulation with neat waveforms.	5M
	ii) Explain DM system with a neat block diagram.	5M

15. A).	i) Explain the principle of operation a QPSK system.	5M
	ii) Explain DPSK system with an example.	5M

OR

15. B).	i) Derive the probability of error for coherent binary PSK system.	5M
	ii) Write short notes on eye diagram.	5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Electromagnetic Fields and Tranmission Lines
(Electronics & Communication Engineering)

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	What is Conduction current density J_c ?	1 M
2.	What is the unit of Electric field intensity?	1 M
3.	What is the Force on a current element in magnetic field?	1 M
4.	The unit of magnetic flux.	1 M
5.	If E is a vector then $\nabla \cdot (\nabla \times E) =$	1 M
6.	$\nabla \times H =$	1 M
7.	What is the Phase velocity in free space?	1 M
8.	Define Poynting theorem.	1 M
9.	What are the secondary constants of transmission line?	1 M
10.	Condition for Lossless Transmission Line.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Explain different types of charges.   4M
ii) What is coulumb's law? Find electric field intensity.   6M

OR

11. B). i) Derive the expression for capacitance of the spherical conductor.   5M
ii) Derive and plot the electric filed intensity of a spherical volume distribution of charge using gauss's law.   5M

12. A). Find magnetic field strength, H, on the Z- axis at a point P(0,0,10m), due to a current carrying circular loop, $x^2 + y^2 = \rho^2$ in Z=0 plane.   10M

OR

12. B). Obtain an expression for differential magnetic field strength dH due to differential current element I dl using biot savart law: 10M

13. A). i) What is the inconsistency of Amperes law? And derive modified amperes law equation.   5M
ii) Explain Faradays law for time varying fields.   5M

OR

13. B). Derive the boundary conditions for the normal components of Electrostatic fields at the boundary between two perfect dielectrics.   10M

(P.T.O..)

14. A).   i) What is meant by polarization of a wave? Explain.   5M

              ii) Define Brewster angle and derive an expression for Brewster angle when a wave is   5M
              parallelly polarized.

OR

14. B).   Derive the uniform plane wave equations from the fundamentals and determine the Loss   10M
              tangent.

15. A).   i) Derive the expression for the input impedance of a loss-less line.   5M

              ii) What is meant by inductive loading? What are its advantages and disadvantages.   5M

OR

15. B).   Explain the significance and design of single stub impedance matching. Discuss the   10M
              factors on which stub length depends.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Computer Oriented Statistical Methods
(Common for CSE & CSC)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1. Given $P(A)=\dfrac{1}{2}$, $P(B)=\dfrac{1}{3}$, $P(A\cap B)=\dfrac{1}{4}$ state whether the events A and B are independent or not.   1 M

2. State Baye's theorem.   1 M

3. Find the value of p If the mean of the binomial distribution is 6 and variance is 2.   1 M

4. Write the probability mass function of a poisson distribution.   1 M

5. Write the distribution function of uniform distribution.   1 M

6. Find $P(z \le 3)$ 1 M

7. Define alternative hypothesis.   1 M

8. What is the test statistic for single proportion?   1 M

9. Write any one property of a transition probability matrix.   1 M

10. What is one step transition probability?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). i) In a group consisting of men and women are equal in number. 10% of the men and 45% of the women are unemployed. If a person is selected randomly from the group then find the probability that the person is an unemployed.   5M

ii) A card is drawn from a well shuffled pack of cards. What is the probability that it is either a spade or an ace   5M

OR

11. B). i) Two marbles are drawn in succession from a box containing 10 red, 30 white, 20 blue and 15 orange marbles with replacement being made after each draw. Find the probability that (a) both are white (b) first is red and second is white.   5M

ii) Define discrete and continuous random variables with suitable examples each.   5M

12. A). 10% of the bolts produced by a certain machine turn out to be defective. Find the probability that in a sample of 10 bolts selected at random exactly two will be defective using (i) Binomial distribution   (ii) Poisson distribution and comment on the results.   10M

OR

12. B). i) The mean and variance of a Binomial distribution are 3 and $\dfrac{9}{4}$, Find the value of n   5M

ii) Suppose X has a Poisson distribution .If $P(X=2)=\dfrac{2}{3} P(X=1)$, Find $P(X<3)$ 5M

(P.T.O..)

13. A). In a test on 1000 electric bulbs, it was found that the number of bulbs was normally distributed with an average life of 2040 hours and a standard deviation of 60 hours. How many bulbs are likely to be in usage for (a) more than 2150 hours   (b) less than 1950 hours   (c) more than 1920 hours but less than 2100 hours?   10M

OR

13. B). A population consists of five numbers 3,5,7,11 and 15. consider all possible samples of size two which can be drawn with out replacement from this population. Find i) the mean of the sampling distribution means ii) standard deviation of the sampling distribution of means   10M

14. A). Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women in favour of the proposal. Test the hypothesis that proportion of men and women in favour of the proposal at 5% LOS   10M

OR

14. B). To examine the hypothesis that the husbands are more intelligent than the wives, an investigator took a sample of 10 couples and administered them a test which measures the IQ. The results are as follows: 10M

Husbands	117	105	97	105	123	109	86	78	103	107
Wives	106	98	87	104	116	95	90	69	108	85

Test the hypothesis with a reasonable test at the level of significance of 0.05

15. A). The transition probability matrix of a Markov chain $\{X_n\}$; n = 1,2,3,..... having 3 states   10M
1,2 and 3 is $P = \begin{bmatrix} 0.1 & 0.5 & 0.4 \\ 0.6 & 0.2 & 0.2 \\ 0.3 & 0.4 & 0.3 \end{bmatrix}$ and the initial distribution is $P^{(0)} = (0.7, 0.2, 0.1)$

Find (i) $P\{X_2 = 3\}$ (ii) $P\{X_3 = 2, X_2 = 3, X_1 = 3, X_0 = 2,\}$

OR

15. B). Let $(x_n : n \in N_0)$ be a Markov chain with transition probability matrix   10M

$$P = \begin{bmatrix} 0.9 & 0.1 & 0 & 0 \\ 0.5 & 0 & 0.5 & 0 \\ 0.3 & 0 & 0 & 0.7 \\ 0.2 & 0 & 0 & 0.8 \end{bmatrix}$$

Sketch the transition diagram for the above chain and determine the accessibility between each pair of states.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Operating Systems
(Common for CSE, CSC, IT & CSD)

Date: 19.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. List any two services of Operating System.   1 M
2. Differentiate between Multiprogramming and Multiprocessing.   1 M
3. Compare the use of semaphores Vs monitors in handling Critical Section.   1 M
4. Demonstrate working of multi-processor scheduling.   1 M
5. Discuss working principle of monitors.   1 M
6. Identify the differences between pipes and named pipes.   1 M
7. Explain Thrashing.   1 M
8. Analyze Belady's Anomaly in page replacement algorithm.   1 M
9. Describe lseek() system call.   1 M
10. List any two file protection mechanisms.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Explain any three system calls with syntax and example.   5M
        ii) Write short note on Time shared systems and Multiprogrammed systems.   5M
OR
11. B). i) Define Thread and its priorities. Write short notes on Multithreading.   5M
         ii) Explain the different Process States with a diagram.   5M

12. A). Explain Deadlocks Characterization, Methods for Handling Deadlocks   10M
OR
12. B). i) Briefly Discuss Bankers Algorithm for deadlock detection.   5M
         ii) Write the resource allocation algorithm for Deadlock detection.   5M

13. A). Explain interprocess communication. Explain working principle of FIFO's.   10M
OR
13. B). Explain Process Synchronization & Demonstrate Classic Problems of Process   10M
         Synchronization.

14. A). Discriminate between Segmentation and paging with neat diagram.   10M
OR
14. B). Assume that there are 3-page frames which are initially empty. If the page reference string   10M
         is 1, 2, 3, 4, 2, 1, 5, 3, 2, 4, 6, the number of page faults using page replacement
         algorithms i) LRU   ii) optimal   iii) LFU

15. A). Explain different file allocation methods with diagram.   10M
OR
15. B). i) Explain with neat diagram how Free-space Management is implemented?   5M
         ii) Describe following system calls (i) read (ii) write (iii) open.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Business Economics & Financial Analysis
(Computer Science & Engineering)

Date: 22.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Define Business.	1 M
2.	What is National income?	1 M
3.	What is meant by Elasticity?	1 M
4.	List out the determinants of supply.	1 M
5.	List out the types of Costs exist in manufacturing a product.	1 M
6.	What is meant by Monopoly?	1 M
7.	How are Accounting Concepts and Conventions differentiated?	1 M
8.	Describe Accounting Equation.	1 M
9.	Explain Liquidity.	1 M
10.	Explain the term Leverage.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Explain the Nature and Scope of Business Economics.	10M

OR

11. B).	List out the features of Limited Liability Company and Partnership Company.	10M

12. A).	i) Explain the steps involved in demand forecasting.	5M
	ii) Explain different methods of Demand forecasting.	5M

OR

12. B).	Compute price elasticity of demand using the following data.	10M

The quantity demand for the product X is 30 units, when the price is Rs.15.
The quantity demanded increased to 40 units, as price decreased to Rs.10.

13. A).	How can an Organization arrive at least cost combination of different inputs.	10M

OR

13. B).	Explain about Short and Long run cost functions.	10M

14. A).	Journalise the following transactions and prepare necessary ledgers	10M

Jan 1, 2021 Commenced business with Cash Rs.8,00,000
Jan 3, 2021 Purchased Goods worth Rs.1,50,000
Jan 8, 2021 Sold Goods to Mr. Ramu Rs.1,10,000
Jan 30, 2021 Salaries paid Rs.40,000
Jan 30, 2021 Rent paid Rs.20,000

(P.T.O..)

OR

14. B). State under what heading, (Personal, Real, or Nominal) would you classify each of the   10M
following accounts.

i) salary prepaid account ii) salary outstanding account iii) rent account iv) bank account
v) insurance unexpired vi) proprietor's account vii) bad debts account viii) furniture
account ix) goodwill account x) patents account.

15. A). Explain different types of ratios upon which the company will be assessed with formulae.   10M

OR

15. B).   10M

Particulars	Rs.	Particulars	Rs.
To Opening Stock	40,000	By Net sales	1,15,000
To Purchases	70,000	By Closing stock	35,000
To Wages	10,000		
To Gross Profit (c/d)	30,000		
	1,50,000		1,50,000
To Administrative exp	15,000	By Gross Profit (b/d)	30,000
To Selling expses	10,000	By Sundry Receipt	15,000
	65,000		65,000

From the above data calculate Gross Profit Ratio, Net Profit Ratio and Operating Profit
Ratio.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Database Mangement Systems
(Common for IT, CSM & AIM)

Date: 22.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. Define instances and schemas of database.   1 M
2. Define weak entity and strong entity sets.   1 M
3. What is domain relational calculus?   1 M
4. How is a view different from a table?   1 M
5. What is the purpose of normalization?   1 M
6. Define a NULL value? How do you retrieve null values from the database? 1 M
7. Differentiate between implicit and explicit locking.   1 M
8. List the properties of transaction.   1 M
9. Differentiate between primary and secondary indexes.   1 M
10. Why tree-structure indexes are good for searches?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Discuss the main characteristics of the database approach and how it differs from traditional file systems.   5M

ii) Discuss various components of a DBMS with a neat diagram.   5M

OR

11. B). What are the different types of attributes that occur in ER model? Draw an ER diagram of Banking system taking into account at least five entities. Indicate all keys, constraints and assumptions that are made.   10M

12. A). What are integrity constraints? Why they are important? Discuss about different types of integrity constraints with suitable examples.   10M

OR

12. B). What are the relational algebra operations supported in SQL? Explain with examples.   10M

13. A). Consider the SAILOR DATABASE   10M
Sailors (sid:string, sname:string, rating:integer, age:real)
Boats (bid:integer, bname:string, color:string)
Reserves (sid:integer, bid:integer, day:date)
Based on the above schema, write the corresponding SQL
queries for the following:
　i)　Find the colors of boats reserved by 'Lubber'.
　ii)　Find the names of sailors who have reserved at least one boat.
　iii)　Find the names of sailors who have reserved a red or green boat.
　iv)　Find the names of the sailors who have reserved both a Red boat and a Green boat.
Find names of sailors who have reserved all boats.

(P.T.O..)

13. B). Explain 1-NF, 2-NF, and 3-NF with an example for each.   10M·

14. A). Write about immediate update and deferred update recovery techniques. Explain the key features of recoverability of schedule and also explain log based recovery.   10M

OR

14. B). What is conflict serializability? Does two phase locking protocol ensure conflict serializability? Justify your answer with appropriate examples.   10M

15. A). Compare and contrast ISAM with B+trees and hashing. Highlight the strengths and weaknesses of each method in terms of performance, complexity, and use cases.   10M

OR

15. B). Construct a B+ tree with fan-out (no of points per node) is 3 for the following search key values: 80, 50, 10, 70, 30, 100, 90. Assume that the tree is initially empty and the values are added in the order given.   10M
i) Show the tree after insertion of 10, after insertion of 30, and after insertion of 90.
ii) Show the tree after deletion of 30, 10.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Discrete Mathematics
(Common for CSE, IT, CSM, CSD & AIM)

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. Explain Biconditional with example.   1 M
2. Write the negation of the following statement.   1 M
   "John will take a job in industry or go to graduate school".
3. If $f : R \to R$ is defined by $f(x) = \sqrt{x^2 + 1}$ find $f^{-1}(x)$.   1 M
4. Explain about Transitive relation.   1 M
5. Give an example of a semi group, which is not a group.   1 M
6. Define partial order relation.   1 M
7. Compute 15p3.   1 M
8. For a set of six true or false questions, find the number of ways of answering all questions.   1 M
9. Define spanning sub graph.   1 M
10. Explain about Chromatic number.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Show that $\neg(p \wedge q) \to \left[\neg p \vee (\neg p \vee q) \right] \Leftrightarrow (\neg p \vee q)$ without using truth table.   5M

ii) Obtain the principal conjunctive normal form of   5M
$(P \wedge Q) \vee (\neg P \wedge Q) \vee (Q \wedge R)$.

OR

11. B). i) show that $(x)(P(x) \vee Q(x)) \Rightarrow (x)P(x) \vee (\exists x)Q(x)$ 5M
ii) Using CP-rule show that $p \to s$ from $\neg p \vee q, \neg q \vee r, r \to s$.   5M

12. A). i) In a class of 25 students,12 have taken mathematics.8 have taken mathematics but not   5M
Biology. Find the number of students who have taken Mathematics and Biology and those
who have taken Biology but not mathematics.
ii) P.T. Congruence is an Equivalence relation.   5M

OR

12. B). i) Explain about injective and surjective functions. Illustrate an example an example   4M
which is injective but not surjective.

ii) If $f : R \leftarrow R$ such that $f(x) = 2x + 1$ and $g : R \to R$ such that $g(x) = \dfrac{x}{3}$ then verify   6M
$(g \circ f)^{-1} = f^{-1} \circ g^{-1}$.

(P.T.O..)

13. A). i) Explain the properties of abelian group with examples.   5M

     ii) What is lattice? Explain the properties of lattice.   5M

<div align="center">OR</div>

13. B). i) A={1,2,3,4,5....} verify whether the given set is monoid for the binary operator *.   5M

     ii) R={<1,1>,<1,2>,<2,1>,<2,2>,<3,1>,<3,2>,<3,3>} check the given relations is equivalence relation.   5M

14. A). i) How many four digit numbers can be formed using the digits 0,1,2,3,4,5 if   6M

       (a) repetition of digits is not allowed

       (b) repetition of digits is allowed

     ii) What is the coefficient of x^2yz in $(2x - y + z + 1)^7$.   4M

<div align="center">OR</div>

14. B). i) Find the number of ways in which 3 boys and 15 girls can sit together in a queue such that between two boys at least 2 girls sit.   6M

     ii) Find n ,if $C(n,7) = C(n,5)$. Also Find the number of ways in which 7 different beads can be arranged to form a necklace.   4M

15. A). i) Define simple graph, complete bipartite graph, Pseudo graph and regular graph.   5M

     ii) In a non directed graph, the total number of odd degree vertices is even.   5M

<div align="center">OR</div>

15. B). i) What is spanning tree? Explain different types of algorithm used to construct spanning tree.   5M

     ii) Write a short note on Isomorphism of graphs. Illustrate an example isomorphism between two graphs.   5M

<div align="center">*****</div>

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Algorithm Design and Analysis
(Common for IT & CSD)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. Write any four specifications of an algorithm.   1 M
2. Differentiate between Best, average and worst case efficiency.   1 M
3. What are the advantages and disadvantages of Divide – And – Conquer?   1 M
4. List the Advantages and Disadvantages of Knapsack problem.   1 M
5. Explain the 0/1 Knapsack problem.   1 M
6. Differentiate Backtracking with branch and bound.   1 M
7. What is the use of Topological sorting and list its applications? 1 M
8. What is Transitive closure?   1 M
9. Differentiate between P and NP.   1 M
10. What is the use of computability of algorithms?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Explain performance analysis of an Algorithm.   10M

OR

11. B). Explain the difference between Substitution method and Master's theorem with an example.   10M

12. A). Write recurrence relations for solving OBST using dynamic programming and construct the tree for given data: N = 4, (a1, a2, a3, a4) = (end, got, print, stop) P(1:4) = (1/20, 1/5, 1/10, 1/20) q(0:4) = (1/5, 1/10, 1/5, 1/20, 1/20)   10M

OR

12. B). Explain about Job sequencing with deadlines using Greedy Approach.   10M

13. A). i) What are Hamiltonian Cycles? Present an Algorithm that finds all the Hamiltonian Cycles of a Given Graph.   5M
ii) Explain Travelling Salesman problem with an example.   5M

OR

13. B). Explain the graph coloring problem and write an algorithm solution using Back tracking.   10M

14. A). Develop an algorithm for Depth First Search Traversal of a graph and discuss with an example.   10M

OR

14. B). Explain Kruskal's algorithm to find minimum spanning tree with an example.   10M

15. A). Explain what are P, NP, NP-Hard and NP-Complete problems.   10M

OR

15. B). Explain Min – Max Algorithm in detail with an example.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Java Programming

(Information Technology)

Date: 26.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1. How do you declare and initialize a variable in Java, and what are the rules for naming variables?   1 M
2. What is the use of *super* keyword?   1 M
3. Explain the difference between byte streams and character streams in Java?   1 M
4. Define Exception and give the keywords used in exception handling.   1 M
5. What is the significance of CLASSPATH?   1 M
6. Write the statements to add the following to the HashSet {apple, mango, grapes}   1 M
   a) Add the string "pineapple" of the HashSet.
   b) Add the string "pomegranate" to the end of the HashSet.
7. How can you use the synchronized keyword in Java to provide thread-safe access to shared resources?   1 M
8. Write the steps involved in connecting to database using JDBC.   1 M
9. What is a JTable in Swing and how do you use it?   1 M
10. Brief about event delegation model.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Define constructor. Specify the rules to create constructor. Explain the types of constructor with an example.   10M

OR

11. B). Write a Java program that uses polymorphism to calculate the area of different shapes. Create a base class called Shape with methods such as getArea() and subclasses such as Rectangle, Circle, and Triangle. Each subclass should implement the getArea() method to calculate the area of that shape.   10M

12. A). Write a Java program that handles exceptions when performing calculations with user input. The program should prompt the user to enter two numbers and an operator (+, -, *, /). The program should then perform the specified operation on the two numbers and display the result. If the operator is invalid or the numbers cannot be parsed, the program should catch the NumberFormatException or IllegalArgumentException and display an error message.   10M

OR

12. B). Write a program to demonstrate creation and accessing a file randomly.   10M

(P.T.O..)

13. A). Make use of the StringTokenizer class and print the number of vowels in each word of 10M
given string.
Input: Java is easy
Output:
Java: 2
is: 1
easy:2

OR

13. B). Create a linked list collection object and perform the following operations on it. 10M
i). Inserting element at first
ii). Inserting element at last
iii). Deleting first element
iv). Deleting last element

14. A). Compare the Thread class and Runnable interface. If Runnable interface is not present, is 10M
it possible to achieve multithreading through Thread class in case of inheritance. Justify
your answer with an example.

OR

14. B). Write a program to use CallableStatement for update the salary of employees by 10% for 10M
departmet 10.
EMP (Empno, Ename, Salary, Deptno)

15. A). Compare the following components by giving syntax for creating object for each 10M
component.
a) JList and JFrame
b) JCheckBox and JComboBox
c) JButton and JToggleButton

OR

15. B). Create a Java program that allows the user to enter text into a text field and displays the 10M
text in a label. The program should use the KeyListener interface to handle keyboard
events.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Computer Organization and Architecture
(CSD)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1.	What is high impedance state in bus buffer?	1 M
2.	What is register-reference instruction?	1 M
3.	Define Micro-operation.	1 M
4.	Write the fetch routine in symbolic microinstructions.	1 M
5.	Write any 2 problems with signed binary integer representation	1 M
6.	Give a reason for the use of guard bits	1 M
7.	What is the difference between isolated I/O and memory mapped I/O?	1 M
8.	What is segmented page mapping?	1 M
9.	Write about Pipeline conflicts	1 M
10.	Describe about MIMD.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A).	Explain the execution of a complete instruction with an example.	10M
	OR	
11. B).	Explain in detail about RTL.	10M
12. A).	Distinguish between micro programmed and hardwired control unit.	10M
	OR	
12. B).	Write in detail about program control and its challenges	10M
13. A).	i) Write about Arithmetic and Logic Unit with neat diagram.	5M
	ii) Explain Integer representation.	5M
	OR	
13. B).	With an example, explain Booth Multiplication algorithm.	10M
14. A).	Discuss the various mapping techniques used in cache memories.	10M
	OR	
14. B).	Explain the following i) Memory mapped I/O ii) I/O Registers iii) Hardware Interrupts and Programmed I/O.	10M
15. A).	i) Explain the inter – processor communication using message passing and shared variable	5M
	ii) Draw and explain centralized shared memory architecture	5M
	OR	
15. B).	i) Explain serial arbitration (Daisy Chain).	5M
	ii) Explain parallel arbitration.	5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Computer Network

(CSC)

Date: 22.07.2024 AN　　　　　　Time: 3 hours　　　　　　Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.　　　　　10x1=10M

1. Explain the network ARPANET.　　　　　　　　　　　　1 M
2. Illustrate the twisted pair properties.　　　　　　　　　1 M
3. Explain a simplex stop and wait protocol for Noisy channel.　1 M
4. Explain the channel allocation problem.　　　　　　　　1 M
5. How Choke packet help in congestion control?　　　　　1 M
6. Explain the concept involved in Flooding algorithm.　　　1 M
7. Explain the duties of transport layer.　　　　　　　　　1 M
8. Write two differences between TCP and UDP　　　　　　1 M
9. Summarize about SNMP.　　　　　　　　　　　　　　1 M
10. How streaming of audio and video is done.　　　　　　1 M

PART-B
Answer the following. Each question carries TEN Marks.　　　5x10=50M

11.A). What is the significance of layered architecture? Explain the OSI layered architecture with neat sketch.　　10M

OR

11. B). Solve CRC division using polynomials using an example.　10M

12. A). Analyze the working of Carrier Sense Multiple Access (CSMA) Protocol.　10M

OR

12. B). Distinguish between stop and wait protocol and sliding window protocol.　10M

13. A). What are the reasons for congestion? What are the problems with congestion?　10M

OR

13. B). Illustrate the distance vector routing algorithms used in computer networks with an example.　10M

14. A). Evaluate the mechanism of three-way handshake protocol for TCP　10M

OR

14. B). Determine the operation of UDP. Explain UDP checksum with an example.　10M

15. A). Determine the role of a DNS on a computer network with reference to its components.　10M

OR

15. B). Analyze the message format and the message transfer and the underlying protocol involved in the working of electronic mail.　10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Cyber Security Essentials
(CSC)

Date: 24.07.2024 AN　　　　Time: 3 hours　　　　Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.　　　　10x1=10M

1.	What is Virtualization?	1 M
2.	Mention any two public key encryption techniques.	1 M
3.	What do you mean by Anti-forensics?	1 M
4.	Define a Botnet.	1 M
5.	State the principle of flooding.	1 M
6.	List different web exploit tools.	1 M
7.	What is DDL injection?	1 M
8.	What is Man-in-the-Middle attack?	1 M
9.	List any two live system tools used in Memory Forensics.	1 M
10.	What are the techniques used to analyze the behavior of malicious code?	1 M

PART-B
Answer the following. Each question carries TEN Marks.　　　　5x10=50M

11.A). i) What is Symmetric encryption? Explain. 　5M
ii) With a neat sketch, explain about structure of DNS 　5M

OR

11. B). i) Define RFID and list the applications of it. 　5M
ii) Write a note on Windows Tokens 　5M

12. A). Why attackers use Proxies? Discuss. 　10M

OR

12. B). i) Briefly explain about Rogue Antivirus. 　5M
ii) Describe about fraud techniques. 　5M

13. A). i) Explain the concept of Stack-Based buffer overflows. 　5M
ii) How do you detect and prevent Race conditions? 　5M

OR

13. B). Discuss about the following. 　10M
i) Cross-Site scripting　　ii) DNS amplification attack.

14. A). i) What is meant by Virtual Machine Obfuscation? Give an example. 　5M
ii) Explain about Rootkits 　5M

OR

14. B). Discuss about Persistent software techniques. 　10M

15. A). i) Why Memory Forensics is important? 　5M
ii) How Malicious code naming is used in Industry? 　5M

OR

15. B). Discuss about Honeypots. 　10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Computer Organization and Architecture
(Common for CSE & CSC)

Date: 26.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Define Instruction Codes and their role in computer instructions.	1 M
2.	Describe the purpose of a Program Counter (PC) in computer architecture.	1 M
3.	Define Address Sequencing in microprogramming.	1 M
4.	What are Instruction Formats in the context of CPU operations?	1 M
5.	What is the purpose of overflow detection in addition and subtraction operations?	1 M
6.	What is the advantage of floating point representation over fixed point representation?	1 M
7.	What the importance of cache coherence in multi-core processors.	1 M
8.	what is an input-output interface and discuss its role in computer systems.	1 M
9.	What are the characteristics of RISC architecture.	1 M
10.	What are the different types of interconnection structures used in multiprocessor systems.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Draw and label a detailed block diagram of a Digital Computer, explaining the function of each major component.   10M

OR

11. B). Discuss the types of Arithmetic Micro operations performed by a CPU. Explain the steps involved in executing an arithmetic operation using RTL.   10M

12. A). Explain micro program with an example.   10M

OR

12. B). Define Program Control in the context of CPU operations. Explain how Program Counter (PC) and instruction sequencing are managed during program execution.   10M

13. A). Discuss the concept of data types in programming languages. Explain how data types of influence memory allocation and performance in computing systems.   10M

OR

13. B). i) Explain decimal arithmetic operations.   4M
ii) Explain Booth's Multiplication Algorithm with an example   6M

14. A). Explain direct memory access (DMA) in detail.   10M

OR

14. B). Explain the concept of associative memory. Discuss its advantages and limitations in terms of access speed and implementation complexity.   10M

15. A). Discuss the design and implementation of an arithmetic pipeline in processor architecture.   10M

OR

15. B). Explain the architecture of the Intel 8085 microprocessor.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Automata Theory and Compiler Design
(Common for CSM & AIM)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1.	Give the formal definition of DFA.	1 M
2.	List the applications of finite automata.	1 M
3.	State pumping lemma for regular languages.	1 M
4.	What is a parse tree?	1 M
5.	What is an instantaneous description of TM?	1 M
6.	Define recursive language.	1 M
7.	Differentiate between analysis and synthesis parts of compilation.	1 M
8.	Give the structure of LEX program.	1 M
9.	What is an activation record?	1 M
10.	Differentiate between synthesized and inherited attributes.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). Explain the procedure for converting an NFA to DFA. Convert the following NFA to DFA.   10M

	0	1
→ q_0	$\{q_0, q_1\}$	$\{q_0, q_3\}$
q_1	$\{q_2\}$	$\{\}$
q_2	$\{q_2\}$	$\{q_2\}$
q_3	$\{\}$	$\{q_4\}$
*q_4	$\{q_4\}$	$\{q_4\}$

OR

11. B). Design a DFA for the following languages: 10M
   i. L={awa | w is a string with a's and b's}
   ii. L = {x | x is a string of 0's and 1's and |x| >= 2}
   Set of strings starting with two 0's and ending with at least two 1's.

12. A). State and prove pumping lemma for regular languages. Show that the language L={$0^n 1^{2n}$ | n>=1} is not regular.   10M

(P.T.O..)

12. B). Explain the procedure for converting a given finite automata into regular expression. **10M**
Obtain a regular expression for the following finite automata.

	a	b
→ q_0	q_1	q_3
q_1	q_3	q_2
*q_2	q_2	q_2
q_3	q_3	q_3

13. A). Design a Truing Machine to accept L= {ww^R | w∈$(a+b)^*$ }. Draw the transition diagram **10M**
and justify your design with an example string.

13. B). Give the equivalent CFG for the following PDA **10M**

$$\delta(q_0, \varepsilon, Z_0) = \{(q_1, \varepsilon)\}$$
$$\delta(q_0, 0, Z_0) = \{(q_0, 0Z_0)\}$$
$$\delta(q_0, 0, 0) = \{(q_0, 00)\}$$
$$\delta(q_0, 1, 0) = \{(q_0, 10)\}$$
$$\delta(q_0, 1, 1) = \{(q_0, 11)\}$$
$$\delta(q_0, 0, 1) = \{(q_1, \varepsilon)\}$$
$$\delta(q_1, 0, 1) = \{(q_1, \varepsilon)\}$$
$$\delta(q_1, 0, 0) = \{(q_1, \varepsilon)\}$$
$$\delta(q_1, \varepsilon, Z_0) = \{(q_1, \varepsilon)\}$$

14. A). Explain the different phases of a compiler with a neat diagram. Show the output produced **10M**
by different phases of a compiler for a = b * c + 50; where a, b and c are real numbers.

14. B). Explain the non-recursive implementation of predictive parsers with the help of the **10M**
following grammar

E → E+T | T
T → T*F | F
F → (E) | id

15. A). What is a three-address code? Discuss about implementation of three-address code and **10M**
translate the following expression into quadruple, triple, and indirect triple structures.
a[i]= a+(b*c+d)

15. B). What is meant by activation of procedure? How it can be represented with activation tree **10M**
and record? Explain with quick sort example.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Artificial Intelligence

(Common for CSM & AIM)

Date: 19.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.   10x1=10M

1.	What are the types of intelligent agents?	1 M
2.	What is uniform search?	1 M
3.	What are the components of CSP's?	1 M
4.	Define Horn clauses.	1 M
5.	What is Predicate?	1 M
6.	Write syntax of complex sentence.	1 M
7.	What is Multi agent planning?	1 M
8.	What are the other Classical Planning Approaches?	1 M
9.	Define Conditional Probability.	1 M
10.	Define a Decision Tree.	1 M

PART-B

Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Describe about depth first search and breadth first search with suitable example.   10M

OR

11. B). Explain Hill-climbing search. What the disadvantages of hill climbing search?   10M

12. A). What is Alpha Beta Pruning? Explain with suitable example.   10M

OR

12. B). Explain about CSP Problem with graph coloring example.   10M

13. A). Explain forward and backward chaining with suitable example.   10M

OR

13. B). Explain about Ontological Engineering and What are the limitations of propositional logic? Briefly explain about first order logic predicates and quantifiers?   10M

14. A). Explain the use of planning graph method in providing better heuristic estimation with suitable example?   10M

OR

14. B). Explain about analysis of classical planning approaches.   10M

15. A). State the Baye's theorem. How it is useful for decision making under uncertainty about knowledge?   10M

OR

15. B). Explain the method of semantic inference in Bayesian networks.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Object Oriented Programming through Java
(CSD)

Date: 19.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Explain the features of OOP.	1 M
2.	List out the types of operators used in Java.	1 M
3.	Differentiate between Classes and Interface.	1 M
4.	Define Inheritance.	1 M
5.	What is Exception?	1 M
6.	Define the terms: try, catch.	1 M
7.	Define grid.	1 M
8.	Explain JFrame.	1 M
9.	Define Applet.	1 M
10.	What is event class?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Explain the Control Statements in Java with example.	10M
	OR	
11. B).	List and Explain Java Buzz Words.	10M
12. A).	What is Inheritance? Explain types of inheritances.	10M
	OR	
12. B).	What is interface? Write Differences between classes and interfaces?	10M
13. A).	What is an Exception? Explain different types of Exception?	10M
	OR	
13. B).	Explain about Thread Life Cycle.	10M
14. A).	Difference between AWT and SWING.	10M
	OR	
14. B).	Describe the types of layout manager in detail with an example.	10M
15. A).	Explain Applet life cycle in detail	10M
	OR	
15. B).	Show any five events and its event listener	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Software Engineering

(CSD)

Date: 22.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.   **10x1=10M**

1.	Definition of software engineering.	1 M
2.	List process models.	1 M
3.	Define feasibility study.	1 M
4.	List the characteristics of a good system requirements specification.	1 M
5.	List two principles of good design.	1 M
6.	What are various types of architectural styles?	1 M
7.	State the objectives of testing.	1 M
8.	Differentiate verification and validation.	1 M
9.	Define risk and its types.	1 M
10.	What are software reviews?	1 M

PART-B

Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A).	Define software life cycle. List all life cycle models and explain spiral model with a neat diagram.	10M

OR

11. B).	Explain in detail about the concept of CMMI.	10M
12. A).	i) Differentiate functional and non-functional requirements.	5M
	ii) Give the steps involved in initiating requirements engineering.	5M

OR

12. B).	Classify the different types of checks carried out on the requirements in the requirements document during the validation process.	10M
13. A).	Implement Architectural Styles.	10M
	(i) Data centered Architecture and Data Flow Architecture. (ii) Call and Return Architecture and Object Oriented Architecture. (iii) Layered Architecture.	

OR

13. B).	Construct software design model using class, sequence, collaboration and usecase diagrams.	10M
14. A).	What is black box testing? Explain the different types of black box testing strategies. Explain by considering suitable examples.	10M

OR

14. B).	Illustrate in detail about metrics used for software quality, process and products.	10M
15. A).	i) Compare reactive and proactive risk strategies.	5M
	ii) Analyze the usage of risk projection and refinement.	5M

OR   10M

15. B).	Examine in detail about ISO 9000 quality standards.	

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Digital Electronics

(CSD)

Date: 26.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.   **10x1=10M**

1. Simplify the given Gray code number to equivalent binary 001001011110010   1 M
2. Find the Simplified Boolean expression for the following function   1 M
    Y=(A+B)(A+C)(B+C)
3. Simplify $F(x,y,z)= \sum m (0,1,2,4,6)$ using K-map.   1 M
4. What is Maxterm and Minterm?   1 M
5. Write the differences between multiplexer and demultiplexer?   1 M
6. What is Combinational circuit? Give examples.   1 M
7. Define flip-flop? What are the different types of flip-flops?   1 M
8. Define race around condition? How it can be avoided?   1 M
9. Define Static RAM.   1 M
10. How PLAs differ from PALs.   1 M

PART-B

Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). i) Simplify $(A0F9.0EB)_{16}$ to decimal, binary, octal.   5M

      ii) Implement the following function using NAND gates F=A(B+CD)+(BC)'   5M

OR

11. B). i) What is the gray code equivalent of the Hex Number $(3A7)_{16}$ 5M

      ii) Reduce the expression F=A[B+C'(AB+AC')]'   5M

12. A). Find the following Boolean expression using K-map and implement with universal gates   10M
      $F=\sum_m(0,2,6,10,11,12,13) + d(3,4,14,15)$

OR

12. B). Find the Boolean expression using K-Map for f (A,B,C,D)=   10M
      $F=\sum_m(4,5,6,9,12,13) + d (7,11)$

13. A). Implement the following Boolean function with 8:1 multiplexer   10M
      $F(A, B, C, D) =\sum m (0,2,6,10,11,12,13)+d (3,8,14)$

OR

13. B). i) Design 2-bit Magnitude comparator with its truth table.   5M

      ii) Explain the design procedure for combinational logic circuits.   5M

(P.T.O..)

14. A). i) Explain the operation of JK master slave flip flop. Explain its truth table.   5M

      ii) Draw and explain the working of D-flip-flop. Give truth table and characteristic equation.   5M

OR

14. B). i) What is counter? Give the difference between synchronous and asynchronous counters.   5M

      ii) Explain the operation of clocked SR flip-flop with its characteristic table.   5M

15. A). i) Write short note on i) EPROM   ii) EEPROM   5M

      ii) Implement the following function using a PAL   5M

      $F (A, B, C, D) = \Sigma m (0, 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 14, 15)$

OR

15. B). i) Write the comparison between PROM, PLA, and PAL.   5M

      ii) Design 3 bit binary to Gray Code converter using PLA.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Basics of Power Plant Engineering
(Common for CSE, IT, CSC, CSM & AIM)

Date: 30.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.　　　　　　　　　　10x1=10M

1.	What is the function of the boiler in coal power plant	1 M
2.	What is the Rankine cycle method?	1 M
3.	List the components of gas turbine power plant.	1 M
4.	Define the term "Combined Cycle Power Plant."	1 M
5.	What is the primary fuel used in most nuclear reactors?	1 M
6.	What is the main purpose of control rods in a nuclear reactor?	1 M
7.	What is the function of a penstock in a hydroelectric power plant?	1 M
8.	What is the difference between Solar PV and Solar Thermal systems?	1 M
9.	What is the main environmental concern associated with nuclear power plants?	1 M
10.	What is a power tariff?	1 M

PART-B
Answer the following. Each question carries TEN Marks.　　　　5x10=50M

11.A).	Discuss the layout and main components of a modern coal-based thermal power plant.	10M
	OR	
11. B).	Explain the concept of binary cycles and their application in thermal power plants.	10M
12. A).	Describe the Brayton cycle with the help of a T-S diagram and explain the various processes involved.	10M
	OR	
12. B).	Explain the working principle and components of integrated gasifier based combined cycle power plant (IGCC).	10M
13. A).	Explain the working principle of a Boiling Water Reactor (BWR).	10M
	OR	
13. B).	Explain the principles and benefits of Fast Breeder Reactors (FBR).	10M
14. A).	Explain the typical layout and components of a hydroelectric power plant.	10M
	OR	
14. B).	Explain the principles and operation of tidal power systems.	10M
15. A).	Discuss the factors affecting the load curve and its importance in power system planning.	10M
	OR	
15. B).	Explain the environmental issues associated with coal and nuclear power plants and the technologies used for waste disposal.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Entrepreneurship

(Common for CSE, CSM & AIM)

Date: 30.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.   **10x1=10M**

1.	What do you understand by Entrepreneurship?	1 M
2.	Explain the concept of Entrepreneur.	1 M
3.	Explain Entrepreneurial ego.	1 M
4.	Explain Corporate Entrepreneurship.	1 M
5.	What do you understand by Venture?	1 M
6.	Explain franchising.	1 M
7.	Explain patents.	1 M
8.	What do you understand by copyrights?	1 M
9.	What do you understand by Strategy?	1 M
10.	Explain Planning.	1 M

PART-B

Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). Examine the economic approach to entrepreneurship, which highlights the role of entrepreneurs in market equilibrium and economic growth. How do entrepreneurs contribute to economic development according to this perspective? Discuss the policy implications that stem from this approach.   10M

OR

11. B). Examine the key factors driving the growth of social entrepreneurship in the 21st century.   10M

12. A). What inspired you to embark on your entrepreneurial journey? Was there a specific event or person that influenced your decision to start your own business?   10M

OR

12. B). What are the common sources of stress for entrepreneurs, and how can they manage these stressors effectively?   10M

13. A). Examine the different Opportunities identification in entrepreneur venture   10M

OR

13. B). How does imagination play a crucial role in the initial stages of entrepreneurial ventures? Can you provide examples of successful entrepreneurs who heavily relied on their imaginative capabilities to identify unique business opportunities and create innovative solutions?   10M

(P.T.O..)

14. A). What are the primary differences between copyright protection and other forms of   10M
intellectual property protection?

OR

14. B). What are the key steps involved in the trademark registration process, and how can   10M
businesses ensure that their application is complete and accurate to avoid rejection or
delays?

15. A). What are the fundamental components of strategic planning, and how do they interrelate   10M
to shape an organization's long-term vision and objectives?

OR

15. B). What are the current market trends, customer preferences, and industry dynamics that   10M
influence the positioning strategy?

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Fundamentals of Manufacturing Processes
(Common for IT, CSC, CSM, AIM & CSD)

Date: 30.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	What are the main advantages of casting?	1 M
2.	Name two properties of moulding sands.	1 M
3.	Define TIG welding.	1 M
4.	Name two common welding defects.	1 M
5.	Define strain hardening.	1 M
6.	Name two types of presses used in metal working.	1 M
7.	What is hydrostatic extrusion?	1 M
8.	What are the advantages of tube extrusion?	1 M
9.	What is smith forging?	1 M
10.	What are forging defects?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Describe the sand moulding process in detail, including the materials and steps involved.	10M
	OR	
11. B).	Explain the cupola operation process for melting metals.	10M
12. A).	Discuss the classification and types of welding joints with examples	10M
	OR	
12. B).	i) Discuss the destructive and non-destructive testing methods for welds.	5M
	ii) What are the causes and remedies for welding defects?	5M
13. A).	Explain the different types of bending and forming operations in detail.	10M
	OR	
13. B).	Explain the process and principles of hot and cold spinning.	10M
14. A).	Explain the cold and hot extrusion process with suitable examples	10M
	OR	
14. B).	Discuss the impact extrusion process and its industrial uses.	10M
15. A).	Discuss the various types of forging hammers and their uses.	10M
	OR	
15. B).	Explain the forces involved in forging operations and their impact on the final product.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Ethics in Business & Corporate Governance
(Common for CSE, IT, CSC, CSM, AIM & CSD)

Date: 30.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Describe the different levels of business ethics.	1 M
2.	How can companies ensure that their employees adhere to these ethical principles?	1 M
3.	What is professional ethics?	1 M
4.	What are the key ethical issues in human resource management?	1 M
5.	What is the Global Reporting Initiative (GRI)?	1 M
6.	What challenges does India face in implementing corporate governance practices?	1 M
7.	How do executive directors differ from non-executive directors?	1 M
8.	What constitutes a conflict of interest for a board member?	1 M
9.	What is the scope of CSR in modern businesses?	1 M
10.	What challenges do Indian corporations face in implementing effective CSR programs?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). What are the fundamental principles of ethics that should guide business practices?   10M

OR

11. B). Summarize the key findings of Kohlberg's study on moral development.   10M

12. A). What ethical dilemmas are commonly faced by marketing professionals?   10M

OR

12. B). Provide an example of an ethical dilemma in a business setting and discuss possible solutions.   10M

13. A). What were the main causes of corporate governance failures, and what lessons can be learned from them?   10M

OR

13. B). How do the OECD Principles address the roles and responsibilities of boards and shareholders?   10M

14. A). What are the key components of an effective board structure?   10M

OR

14. B). What are the key duties and responsibilities of directors serving on the audit and compensation committees?   10M

15. A). What are the different models for implementing CSR in an organization?   10M

OR

15. B). How are ethics and social responsibility intertwined in a business context?   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Fundamentals of Database Management Systems
(Common for CE, EEE, ME & ECE)

Date: 30.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1. Define the term "database management system" (DBMS).   1 M
2. What are the key components of a DBMS?   1 M
3. List the steps involved in creating a database using SQL.   1 M
4. What does the 'WITH CHECK OPTION' mean in the context of view updatability?   1 M
5. What is the difference between the ANY and ALL operators in SQL?   1 M
6. Write the purpose of the EXISTS clause in SQL.   1 M
7. Define exceptions in SQL and their role in error handling.   1 M
8. Write control statements in SQL.   1 M
9. What are update anomalies give an example.   1 M
10. Define normalization in the context of database design.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). i) Explain the three-level ANSI-SPARC architecture in database management systems.   5M
ii) Discuss the advantages and disadvantages of the traditional file-based systems with   5M
database management systems.

OR

11. B). i) What is a data model? Explain the different data models.   5M
ii) Consider the following schema to write queries in Domain relational calculus:
Sailor(sid, sname, age, rating)   5M
Boats(bid, bname, bcolor)
Reserves(sid,bid,day)
a) Find the boats reserved by the sailor with id 567.
b) Find the names of the sailors who reserved 'red' boats.
c) Find the boats which have at least two reservations by different sailors.

12. A). Discuss the advantages and disadvantages of Views in SQL with examples.   10M

OR

12. B). Analyze the role of Domain Constraints, Entity Integrity, and Referential Integrity in   10M
database systems with examples.

(P.T.O..)

13. A). Write SQL Queries for the given Schemas   10M

       Employee: (Emp_id,Ename,Designation,Salary,Address)

       Department: (Dept_id, Dname,Dmanager)

       (i) Retrieve the details of the employee who gets the maximum salary

       (ii) List names of all employees who earn more than Rs.10,000

       (iii) Retrieve the total amount spending towards employee salaries

<div align="center">OR</div>

13. B). Consider the following relational database and write SQL quries: 10M

       employee (person_name, street, city)

       works (person_name, company name, salary)

       company (company_name, city)

       i) Find the names of all employees who live in the city "Miami".

       ii) Find the names of all employees whose salary is greater than $100,000.

       iii) Find the names of all employees who live in "Miami" and whose salary is greater than $100,000.

14. A). Explain the concept of recursion in SQL with an example.   10M

<div align="center">OR</div>

14. B). Explain the process of creating subprogram in SQL with an example.   10M

15. A). Discuss the concept of functional dependencies and their role in the normalization process.   10M

<div align="center">OR</div>

15. B). Explain BCNF and 2NF with an example.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Image Processing
(Common for CSE, IT, CSD, CSC, CSM & AIM)

Date: 30.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1.	Mention the basic components of image processing system.	1 M
2.	List the steps involved in digital image processing.	1 M
3.	What is meant by image filtering?	1 M
4.	Explain the two categories of image enhancement.	1 M
5.	What is meant by Image Restoration?	1 M
6.	Mention the two properties in Linear Operator.	1 M
7.	What are the three types of discontinuity in digital image?	1 M
8.	How the derivatives are obtained in edge detection during formulation?	1 M
9.	What are two main types of Data compression?	1 M
10.	Define is coding redundancy.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). i) In detail explain the fundamental steps involved in digital image processing systems.   5M
ii) What are the components of digital image processing system? Explain each in detail.   5M

OR

11. B). i) Explain about Haar Transformation   4M
ii) Derive the following 2-D Fourier Transform properties.   6M
     a) Separability   b) Rotation   c) Scaling

12. A). i) Explain the histogram equalization method of image enhancement.   5M
ii) Explain histogram specification technique in detail with equations.   5M

OR

12. B). i) Show the various techniques in frequency domain to enhance a image with necessary examples.   6M
ii) Distinguish spatial correlation and convolution. Explain each with identical example.   4M

13. A). i) What is image degradation and restoration? Explain them with examples.   6M
ii) Explain the Noise model for image restoration.   4M

OR

13. B). i) Explain the inverse filtering with suitable example.   6M
ii) Explain the Homomorphism filtering.   4M

(P.T.O..)

14. A). i) Discuss about region based image segmentation techniques. Compare threshold region based techniques. Define and explain the various representation approaches?   5M

ii) Explain Boundary descriptors in detail with a neat diagram.   5M

OR

14. B). i) Explain the segmentation techniques that are based on finding the regions directly.   5M

ii) How is line detected? Explain through the operators.   5M

15. A). i) What is data redundancy? Explain three basic data redundancy?   5M

ii) What is image compression? Explain any four variable length coding compression schemes.   5M

OR

15. B). i) Explain the schematics of image compression standard JPEG.   5M

ii) Differentiate between lossless and lossy compression and explain transform coding system with a neat diagram.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Web Programming
(Common for CE, EEE & ECE)

Date: 30.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Distinguish between HTML and XHTML.	1 M
2.	Develop a static web to print 4-5 paragraphs. Each paragraph should be in a different font and color.	1 M
3.	What is an internal CSS style?	1 M
4.	What is universal selector in CSS?	1 M
5.	How are objects created in Java Script?	1 M
6.	Illustrate about event in Java Script.	1 M
7.	What is XML? list its features?	1 M
8.	Compare HTML and XML.	1 M
9.	Explain the advantages of AJAX.	1 M
10.	Illustrate the open method of XMLHttpRequest.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Design a web page containing row of images/logos and when user click on that image its   10M
enlarged view should appear in   i) same window   ii) new window.

OR

11. B). Design a web page that includes a form   10M

12. A). What is CSS? What are the advantages and disadvantages of using CSS in XHTML?   10M

OR

12. B). What do you mean by "class" and "id" in CSS? Explain with examples.   10M

(P.T.O..)

13. A). Distinguish between client side and server side JavaScript with an example. 10M

OR

13. B). Develop a JavaScript code that validates a username, password, Phone number and email id. 10M

14. A). Illustrate the XML File for book record and also write a DTD and XSL for it. 10M

OR

14. B). Explain the key components of XML with examples. 10M

15. A). Develop the code to check whether given username is already in "login_tbl" table or not using AJAX and display appropriate message. 10M

OR

15. B). Explain the role of callback function in AJAX with the neat diagram. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Solid Waste Management
(Common for CSE, CSM & AIM)

Date: 30.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	List three elements of integrated solid waste management.	1 M
2.	Identify sources of commercial solid wastes.	1 M
3.	List the factors which influence solid waste generation rate.	1 M
4.	Name three common processing techniques for solid wastes	1 M
5.	Define Pyrolisis.	1 M
6.	List the types of composting.	1 M
7.	Explain the importance of lining in landfill construction.	1 M
8.	How does leachate contribute to groundwater pollution?	1 M
9.	Define e-waste.	1 M
10.	Explain the types and classifications of nuclear wastes.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Explore the different categories of solid wastes, emphasizing their sources and management challenges.   10M

OR

11. B). Summarize the objectives and key provisions of the Solid Waste Management Rules 2016.   10M

12. A). Describe the principles and practices of on-site handling of solid waste.   10M

OR

12. B). Explain the importance of route planning in optimizing solid waste collection operations.   10M

13. A). Describe the composting process, including pre-processing and post-processing   10M

OR

13. B). Explain the concept of refuse-derived fuel (RDF) and its applications in energy recovery systems.   10M

14. A). Compare and contrast different types of landfill liners   10M

OR

14. B). Evaluate the challenges and considerations associated with landfill reclamation.   10M

15. A). Describe the importance of monitoring systems in hazardous waste management.   10M

OR

15. B). Discuss the challenges and regulatory requirements for long-term storage and disposal of nuclear wastes.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Remote Sensing & Geographical Information Systems
(Common for CSD, CSC, CSM, AIM, CSE & IT)

Date: 30.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	What is pixel coordinate system?	1 M
2.	List out any two photogrammetric imaging devices.	1 M
3.	What are the essential components of a remote sensing system?	1 M
4.	Define visual interpretation.	1 M
5.	What are the common errors that occur in GIS database?	1 M
6.	What are the types of data stored in GIS?	1 M
7.	Define the term: data model.	1 M
8.	What is an interface?	1 M
9.	What are the properties of the raster data model?	1 M
10.	What do you understand by remote sensing data?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	i) Explain how height is measured based on relief displacement?	5M
	ii) Describe the parallax measurement using fiducial line.	5M

OR

11. B).	i) What is meant by photogrammetry? State the principles of aerial photography.	5M
	ii) Explain the fundamentals of stereoscopy.	5M

12. A).	i) What do you understand by electromagnetic spectrum?	5M
	ii) Explain the elements to be considered during visual interpretation techniques.	5M

OR

12. B).	i) Explain detailed process of remote sensing with neat labeled diagram.	5M
	ii) Describe any two Indian satellites and their sensor characteristics.	5M

13. A).	i) Illustrate with an example the spatial and attribute data type.	5M
	ii) Describe different types of coordinate systems.	5M

OR

13. B).	i) Explain how the GIS handle the attribute data.	5M
	ii) Evaluate the outcome of map projection and explain the different types of map projections.	5M

(P.T.O..)

14. A). i) Describe how to represent data using vector model. 5M
ii) What are the main advantages of using shape files? 5M

OR

14. B). i) What is topology? Explain its importance in vector data. 5M
ii) Explain the difference between the geo-base data model and the object bases data model. 5M

15. A). i) Explain how the raster data are divided. 5M
ii) What are the advantages and disadvantages of raster data structure? 5M

OR

15. B). i) Explain the basic elements of the raster data model. 5M
ii) Describe the steps of the application of raster data model. 5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Waste to Energy
(Common for CSE, CSM & AIM)

Date: 01.08.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	What is Agro based waste?	1 M
2.	Define incinerator.	1 M
3.	Recall the definition of pyrolytic oil.	1 M
4.	Write the use of charcoal.	1 M
5.	State the use of fluidized bed gasifier.	1 M
6.	Name any two types of gasifiers.	1 M
7.	List one application of Biomass stove.	1 M
8.	Mention the need of Inclined Grate Combustor	1 M
9.	What is meant by Biomass resources?	1 M
10.	List the types of Biogas plant.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Discuss the various mechanisms as to how municipal solid wastes can be converted to energy?   10M

OR

11. B). Explain about Incinerators and Gasifiers in detail.   10M

12. A). Explain in detail about on how oils are produced by pyrolysis.   10M

OR

12. B). Define pyrolysis and why it is done in non-oxidant chamber.   10M

13. A). Explain gasifier burner arrangement for thermal heating and gasifier engine arrangement for electric power.   10M

OR

13. B). Explain downdraft and updraft gasifiers.   10M

14. A). Discuss the various improvements that could be made in conventional challahs and its types of design.   10M

OR

14. B). Compare the following combustors with respect to operational and constructional features. (i) Fixed bed (ii) Inclined Grate (iii) Fluidized bed.   10M

15. A). Explain the principle & construction of operation of the thermo-chemical conversion process.   10M

OR

15. B). Discuss with neat sketch the anaerobic process in the generation of biogas.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Basics of Marketing
(Common for CSE, CSM & AIM)

Date: 01.08.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	Explain the concept of Selling.	1 M
2.	Explain the concept of Loyalty.	1 M
3.	Define the term Research.	1 M
4.	What is brand positioning in Marketing?	1 M
5.	What is meant by Advertisement?	1 M
6.	Define the term Personal Selling.	1 M
7.	Who is a Wholesaler?	1 M
8.	Why marketing channel is important?	1 M
9.	What is meant by Sales Management?	1 M
10.	What are Sales objectives?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Describe the core marketing concepts and marketing environment.   10M

OR

11. B). What are the different stages involved in Product Life Cycle?   10M

12. A). Explain the factors that determine the consumer behavior.   10M

OR

12. B). Explain the steps of conducting marketing research before entering into a new market and before producing a new product.   10M

13. A). Explain in detail about pricing strategies and break-even pricing.   10M

OR

13. B). Explain the role of digital media as a communication channel.   10M

14. A). Explain the role of Wholesaler and Logistics and also explain their importance in marketing.   10M

OR

14. B). Discuss the integrated marketing channel strategy decisions.   10M

15. A). Elaborate the skillset that a sales manager should possess.   10M

OR

15. B). What are the different types of Sales Organization? Illustrate each type with an example.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Electronics Devices & Circuits
(Common for CSE & CSD)

Date: 01.08.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	List the two applications of the PN junction diode.	1 M
2.	Define the dynamic forward resistance of a PN junction diode.	1 M
3.	Define the clipper and draw the circuit diagram of a series positive clipper.	1 M
4.	Define the clamper and draw the circuit diagram of a positive clamper.	1 M
5.	Show the relationship between β and γ of a transistor.	1 M
6.	Show the circuit diagram of a transistor when it is in the saturation region.	1 M
7.	Define the transconductance (g_m) of a JFET.	1 M
8.	Define the amplification factor (μ) of a JFET.	1 M
9.	List the two applications of Zener diode.	1 M
10.	List the two applications of tunnel diode.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Explain the transition capacitance (C_T) of a PN junction diode and derive an expression for the relation between transition capacitance and reverse bias voltage.	10M
	OR	
11. B).	Explain the diffusion capacitance (C_D) of a PN junction diode and derive an expression for the relation between diffusion capacitance and forward current.	10M
12. A).	Explain the operation of a dual clipper in detail with the necessary diagrams.	10M
	OR	
12. B).	Explain the positive and negative clampers in the cases of positive and negative cycles of the input signal with suitable waveforms in detail.	10M
13. A).	Explain the input and output characteristics of a common-base configuration with a suitable diagram, and also explain the leakage current.	10M
	OR	
13. B).	Compare the CB, CE, and CC configurations in terms of their parameters and also explain why the CE configuration is more important than the CB and CC configurations.	10M
14. A).	Explain the drain and transfer characteristics of an n-channel JFET in detail.	10M
	OR	
14. B).	Compare the MOSFET and JFET, and also compare the BJT and JFET.	10M
15. A).	Construct and explain the operation of UJT in detail, as well as its characteristics.	10M
	OR	
15. B).	Construct and explain the workings of the Varactor diode under low reverse bias and high reverse bias voltages.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: Object Oriented Programming Through Java
(Common for CSM & AIM)

Date: 26.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1.	Give a brief on Garbage collection.	1 M
2.	Compare Method Overriding and Method Overloading.	1 M
3.	Define Extending Interfaces.	1 M
4.	What is a final class? Give an example?	1 M
5.	Define thread priorities.	1 M
6.	List any three common run time errors.	1 M
7.	Define Event and Event Source.	1 M
8.	Explain event delegation model.	1 M
9.	How do applets differ from application program?	1 M
10.	Why is swing called light weight?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A).	i) Explain the significance of Java Virtual Machine.	5M
	ii) Describe different levels of access protection available in Java.	5M

OR

11. B).	i) What are the advantages of "platform independent languages"? Explain how java is platform independent and its features.	5M
	ii) What is message passing? Explain the need of message passing OOPs with example.	5M

12. A).	i) Give an example where interface can be used to support multiple inheritance.	5M
	ii) What are the different types of packages available in Java? Explain how to add classes to a package with a JAVA program.	5M

OR

12. B).	i) Explain the process of defining and creating a package with suitable examples.	5M
	ii) Explain the procedure to call super class members with an example.	5M

13. A).	i) Write a java program to create thread that displays odd numbers starting from 1 to 100.	5M
	ii) Is it essential to catch all types of exceptions? Justify your answer.	5M

OR

13. B).	Explain the life cycle of thread and its methods and purpose of inter thread communication.	10M

(P.T.O..)

14. A).   i) Explain various layout managers in Java   5M

            ii) Write a program that illustrate the use of listeners for implementing delegation event   5M
model.

OR

14. B).   Explain the concept of Auto boxing and Auto-unboxing with a JAVA program.   10M

15. A).   Write a program to create a frame for a simple arithmetic calculator using swing   10M
components and layout managers.

OR

15. B).   Illustrate the following swing components with simple examples: 10M
        i. JButton   ii.   JCheckBox   iii. JRadioButton

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024

Course Name: Software Engineering
(Computer Science & Engineering)

Date: 26.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   10x1=10M

1.	List out life cycle models in software engineering.	1 M
2.	Define CMMI.	1 M
3.	Define functional requirements.	1 M
4.	What is requirement elicitation?	1 M
5.	Recall principles of good design.	1 M
6.	List out the types of architectural styles.	1 M
7.	State the objectives of metrics.	1 M
8.	Differentiate black-box and white-box testing.	1 M
9.	Define RMMM.	1 M
10.	What is the use of formal technical reviews?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Explain in detail about waterfall and Spiral models with neat diagrams.	10M
	OR	
11. B).	Explain in detail about the concept of Capability Maturity Model Integration.	10M
12. A).	Illustrate in detail about various requirement elicitation methods.	10M
	OR	
12. B).	Explain in detail about software requirement documents with SRS formats.	10M
13. A).	Implement different types of Architectural Styles with necessary diagrams.	10M
	OR	
13. B).	Construct software design model using class, sequence, and collaboration diagrams.	10M
14. A).	Compare black-box and white-box testing along with its merits and demerits.	10M
	OR	
14. B).	Analyze the working of different types of software testing techniques.	10M
15. A).	Explain in detail about RMMM used in software project plan.	10M
	OR	
15. B).	Discuss how to ensure software quality assurance using quality standards.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations July/August-2024
Course Name: **Signals & Systems**
(Electronics & Communication Engineering)

Date: 26.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries ONE mark.   **10x1=10M**

1. How do you classify signals based on periodicity?   1 M
2. What is the condition for two signals to be orthogonal?   1 M
3. How do you evaluate the trigonometric fourier series coefficients of a periodic signal?   1 M
4. What is the condition for the existence of fourier transform of a signal?   1 M
5. What are static and Dynamic systems?   1 M
6. What is the relation between input, output and impulse response of a LTI system?   1 M
7. What is the relation between fourier and laplace transform?   1 M
8. Define Region of Convergence.   1 M
9. What is Nyquist Sampling Rate?   1 M
10. What is the relation between convolution and correlation?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). A rectangular function defined as   10M

$f(t) = A$ $0 < t < \pi/2$

     $-A$ $\pi/2 < t < 3\pi/2$

     A $3\pi/2 < t < 2\pi$

Approximate the above function by A cost between the intervals $(0, 2\pi)$ such that the mean square error is minimum.
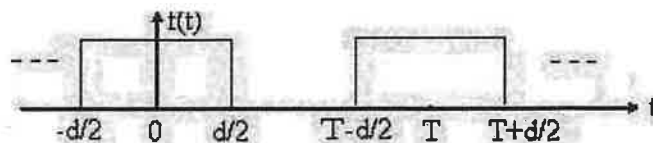
OR

11. B). Prove that if f1(t) and f2(t) are complex functions of real variable t, then the component of   10M

f2(t) contained in f1(t) over the interval (t1, t2) is given by:

$C_{12} = \dfrac{\int f1(t)\, f2^*(t)}{\int f2(t)\, f2^*(t)}$

12. A). Deduce the Fourier series for the waveform of a positive going rectangular pulse train the   10M
following figure.

OR

12. B). i) Explain how Fourier Transform can be derived from Fourier Series.   10M
ii) Find the Fourier transform of Signum function and plot it's amplitude and Phase spectra.

(P.T.O..)

13. A). i) What is an LTI system? Explain its properties. Derive an expression for the transfer   5M
function of an LTI system.

ii) Differentiate between signal bandwidth and system bandwidth.   5M

OR

13. B). i) Explain the difference between a time invariant system and time variant system? Write   5M
some practical cases where you can find the systems.

ii) What is the condition for distortion less transmission through a system? Briefly   5M
Explain.

14. A). i) State and Prove any two properties of Laplace transforms.   5M

ii) Determine the Laplace transform of following signals $x(t)= \sin\omega_0 t\ u(t)$ and $x(t)= \cos\omega_0 t$ 5M
$u(t)$.

OR

14. B). i) A finite series sequence $x[n]$ is defined as $x[n]=\{5,3,-2,0,4,-3\}$.find X[z] for   5M
a) $0 \leq n \leq 5$ b)$-5 \leq n \leq 0$ c) $-3 \leq n \leq 2$ and its ROC.

ii) Find the initial and final Values of $x(n)$ if Z transform of $X(z) = 2/[z^2+1/6z -1/6]$ 5M

15. A). Define autocorrelation & Cross Correlation and state their properties along with proofs.   10M

OR

15. B). With the help of graphical example explain sampling theorem for Band limited signals.   10M

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