CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: Numerical Techniques & Probability Distributions
(Common for CE, ME, CSE, IT, CSC & CSD)

Date: 19.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1. Prove $(1+\Delta)(1-\nabla)=1$.   2 M

2. Evaluate $\Delta \cos x$.   2 M

3. Solve $\dfrac{dy}{dx}=xy+1$ and $y(0)=1$ using Taylors method find $y(0.1)$ 2 M

4. Using Eulers method find $y(0.1)$ given $y(0)=1$ for $y^1 = x^2 - y$.   2 M

5. $Find\ L\left\{4t^2 + \sin 3t + e^{2t}\right\}$ 2 M

6. Find L {cos t}   2 M

7. Find the mean of the uniform probability distribution given by $f(x)=1/n$ for $x = 1,2,3----n$ 2 M

8. Find the constant K such that $f(x)=\begin{cases} Kx^2, if\ 0<x<3 \\ 0, otherwise \end{cases}$ 2 M

9. What is type II error?   2 M

10. Define null hypothesis.   2 M

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

11.A). Find a real root of equation $x^3-x-4=0$ by Bisection method.   10M

OR

11. B). Using Gauss backward interpolation formula find f(32) given f(25)=0.2707,f(30)=0.3027,f(35)=0.3386,f(40)=0.3794   10M

12. A). Evaluate $\int_0^1 \dfrac{1}{1+x}dx$ using trapezoidal and Simpson's 1/3 rule.   10M

OR

12. B). Given $\dfrac{dy}{dx}=-xy^2$, y(0)=2 compute y(0.2) in steps of 0.1 using modified Eulers method.   10M

13. A). Solve the differential equation using Laplace transform $\dfrac{d^2y}{dt^2}+\dfrac{2dy}{dt}+2y=5\sin t, y(0)=y^{'}(0)=0$ 10M

OR

13. B). Using convolution theorem find $L^{-1}\left\{\dfrac{1}{(s+a)(s+b)}\right\}$ 10M

(P.T.O..)

14. A). An unbiased coin is tossed 3 times find the probability of getting i) 2 tail 1 head   10M
ii) all tails   iii) 2 heads 1 tail.

<div align="center">OR   ·</div>

14. B). If the masses of 300 students are normally distributed with mean 68 kg and standard   10M
deviation 3kg, how many students have masses (i)G reater than 72 kg (ii) Less than or
equal to 64 kg   (iii) Between 65 and 71 kg   (iv) Greater than 80 kg.

15. A). A random sample of 400 men and 600 women were asked whether they would like a   10M
flyover near their residence 200 men and 325 women were in favor of the proposal test
the hypothesis that proportions of men and women in favour of the proposal were same at
5% level. ·

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

15. B). Two horses A and B were tested according to the time to run a particular track with the   10M
following results. Test whether the two horses have the same running capacity.

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: Strength of Materials-II
(Civil Engineering)

Date: 22.07.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1.	Define polar modulus.	2 M
2.	What is meant by stiffness of spring?	2 M
3.	State the assumptions in Euler's column theory.	2 M
4.	Write Rankine Gordon formula for long columns subjected to eccentric loading.	2 M
5.	What do you mean by Middle third rule for rectangular sections.	2 M
6.	State the assumptions for determining the stresses in the bending of curved bars.	2 M
7.	What is the difference between symmetrical and unsymmetrical bending?	2 M
8.	Define shear centre.	2 M
9.	Differentiate between thin and thick cylinders.	2 M
10.	Write the equation for longitudinal stress for a thin cylindrical shell subjected to an internal pressure of intensity 'p' with a thickness 't' and diameter 'd'.	2 M

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

11.A). A steel shaft circular in cross section has to withstand a torque of 12×10^3 N-m. If the Shearing stress is not to exceed 45 MPa and angle of twist has to remain with one degree per 5 m length of the shaft, find   **10M**
i) the minimum diameter of the solid shaft,
ii) Minimum diameter of hollow shaft. Given G=8×10^4 MPa.

OR

11. B). A steel wire of diameter 10 mm is used to form a close-coiled helical spring with 10 complete turns. The helical spring with mean radius 6 cm is subjected to an axial pull of 200 N. Find: **10M**
i) spring deflection   ii) maximum shear stress developed and iii) Spring constant.

12. A). Derive an expression for the Euler's crippling load for a long column with Both ends are hinged.   **10M**

OR

12. B). A strut 30 mm in diameter and 2.2 m long is hinged at both ends. It carries a UDL of 60 N/m in addition to an axial thrust of 8000 N. Calculate the maximum stress. Take E = 200 GPa.   **10M**

13. A). A beam circular in plan is loaded with a uniformly distributed load of 120kN/m inclusive of self-weight. The radius of the beam is 6m. The beam is supported by six symmetrically placed columns. Draw shear force and bending moment diagram for one of the spans.   **10M**

(P.T.O..)

13. B). A chimney of uniform thickness is 45 m high with external diameter tapers from 4 m at the base to 2.5 m at the top. The internal diameter at the base is 2.5 m. The chimney is subjected to horizontal wind pressure of 2 kN/m². The self-weight of the chimney is 2500 kN. Determine the maximum and minimum stresses.   10M

14. A). Determine the stresses and deflection for the mid-section of the I beam by unsymmetrical method.   10M

OR

14. B). Develop the equation of Shear centre for T- section.   10M

15. A). A thin cylindrical shell of 120 cm diameter, 1.5 cm thick and 6m long is subjected to internal fluid pressure of 2.5 N/mm². If the value of E= 2×10^5 N/mm² and poisson's ratio $\mu = 0.3$, Calculate   10M
i) Change in diameter, and
ii) change in volume.

OR

15. B). A compound cylinder is made by shrinking a cylinder of external diameter 200 mm and an internal diameter 160 mm over another cylinder of external diameter 160 mm and internal diameter 120 mm. The radial pressure at the junction after shrinking is 8 N/mm². Find the final stress set up across the section, when the compound cylinder is subjected to an internal fluid pressure of 60 N/mm².   10M

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

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1.	Formulate the Bazin's equation?	2 M
2.	Classify different types of channels?	2 M
3.	Define the term 'dynamic similarity'.	2 M
4.	Distinguish between model and prototype	2 M
5.	State the term Impacts of jet	2 M
6.	Define Hydraulic efficiency.	2 M
7.	Interpret different characteristic curves of turbine.	2 M
8.	List out different types of turbines.	2 M
9.	Discuss the phenomenon of cavitation?	2 M
10.	Draw performance curves of a centrifugal pump.	2 M

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

11.A). a) Differentiate between open channel flow and pipe flow. Show the 'energy grade line and the, hydraulic grade line in both cases.   5M
        b) Discuss velocity distribution in an open channel.   5M

OR

11. B). A rectangular channel has a convex curvature in a vertical plane on its bed. At a section the bad has an inclination of 30^0 to the horizontal and the depth measured normal to the flow is 0.75 m. A certain flow produces a normal acceleration of 0.4 g which can be assumed to be constant throughout depth. Determine the pressure distribution and compare with hydrostatic distribution. Also determine the pressure distribution if the boundary has a concave curvature to the flow and rest of the data remain same?   10M

12. A). a) What do you mean by similitude and what are the different types of similarities that must exist between a model and a prototype.   5M
         b) Explain Reynold's number, Froude's number and Mach number. Derive expressions for any above two numbers.   5M

OR

12. B). a) Explain about Angular momentum principle   5M
         b) Derive the expression for stationary and moving flat plate with a neat sketch   5M

(P.T.O..)

13. A). a) Obtain an expression for the force exerted by a jet of water on a fixed vertical plate in the direction of the jet. 5M

b) A jet of water of 60 mm diameter strikes a curved vane at its centre with a velocity of 18 m/s. The curved vane is moving with a velocity of 6 m/s in the direction of the jet. The jet is deflected through an angle of 165°. Assuming the plate to be smooth find: (i) Thrust on the plate in the direction of jet, (ii) Power of the jet, and (iii) Efficiency of the jet. 5M

OR

13. B). A water jet 20 mm in diameter and having a velocity of 90 m/s strikes series of moving blades in a wheel. The direction of the jet makes 20° with the direction of movement of the blade. The blade angle at inlet is 35°. If the jet should enter the blade without striking, what should be the blade velocity? If the outlet angle of the blade is 30°, determine the force on the blade. Assume that there is no friction involved in the flow over the blade 10M

14. A). a) A pelton wheel has to be designed for the following data. Power to be developed = 6,000 kW. Net head available=300 m; Speed= 550 r.p.m.; Ratio of jet diameter to wheel diameter = 1/10; and overall efficiency = 85 %. Find the number of jets; diameter of the jet; diameter of the wheel ; and the quantity of water required. 5M

b) What is draft tube? Write the equation for the efficiency of a draft tube. 5M

OR

14. B). a) Identify the number of turbines and diameter of runner for a power plant having 40 cumecs inflow, 20 m head. The efficiency of turbine is 85% with the speed of 225 rpm. Assume the specific speed as 250 and speed ratio as 0.8. 5M

b) Write short notes on Governing of turbines. 5M

15. A). a) Define the static and manometric heads of a centrifugal pump. State the different types of head losses which may occur in a pump installation. 5M

b) A double-acting reciprocating pump, running at 45 rpm, is discharging 0.009 m3 /s of water. The pump has a stroke of 40 cm. The diameter of the piston is 20 cm. The suction and delivery heads are 3 m and 14m, respectively. Find the slip of the pump and power required to drive the pump. Neglect the effect of piston rod area. 5M

OR

15. B). a) What is the difference between single stage and multistage pumps? 5M

b) Explain the working of centrifugal pump. 5M

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

Date: 26.07.2024 AN　　　　　Time: 3 hours　　　　　Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.　　　　　**10x2=20M**

1.	What is design period? What is its importance?	2 M
2.	What is meant by "per capita demand"?	2 M
3.	Differentiate between coagulation and flocculation?	2 M
4.	What is the purpose of filtration of water?	2 M
5.	What is the purpose water carriage systems?	2 M
6.	Illustrate the Sewer appurtenances manhole.	2 M
7.	What is the purpose of a grit chamber?	2 M
8.	Draw a flow diagram of trickling filter?	2 M
9.	What is an oxidation pond?	2 M
10.	Write short notes on the factors affecting digestion.	2 M

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

11.A). The population of a town in 1980, 1990, 2000 & 2010 are 28000, 40000, 75000 & 92000 respectively. Find the population in 2060 using arithmetic, geometric & incremental increase methods.　　**10M**

OR

11. B). What is fire demand? What are the factors affecting fire demand? Give any two empirical formulae for its estimation?　　**10M**

12. A). Design a rectangular settling tank to treat 2×10^6 l/d of coagulated water. If detention period is to be 3 hrs, the velocity of flow 7.5 cm/min and depth of water as 3m. Calculate the overflow rate for this tank.　　**10M**

OR

12. B). Explain construction, operation, and maintenance problems of slow sand filtration with neat sketches. Also explain its design principles.　　**10M**

13. A). i) The one day and two day BOD of a sewage sample at 30 degree C are 120 mg/l and 180 mg/l respectively. Calculate the 5 day BOD at 20 degree C.　　**5M**
ii) What is the advantage of egg shaped sewers over circular sewers.　　**5M**

OR

13. B). i) What are the various components of a pump house in a water supply scheme? Explain.　　**5M**
ii) What is one pipe and two pipe system of house drainage? Explain with the help of a line diagram.　　**5M**

(P.T.O..)

14. A).   i) Differentiate between standard and high rate trickling filters.   5M

           ii) Discuss the advantages and disadvantages of various types of aerators.   5M

OR

14. B).   Where do you require skimming tank? What is the working principle of a skimming tank?   10M
Explain with Sketch.

15. A).   Design a septic tank and soak pit for a small colony of 300 persons with an average water   10M
supply of 100 litres per capita per day.

OR

15. B).   Give a brief account of general composition of sewage. What is the purpose and principle   10M
involved in its treatment and disposal?

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August 2023

Course Name: Concrete Technology

(Civil Engineering)

Date: 30.07.2024 AN   Time: 3 hours   Max.Marks:70

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Show the wet process flow chart of the manufacturing of OPC.	2 M
2.	Classify the natural and artificial aggregates.	2 M
3.	Define workability of fresh concrete.	2 M
4.	What is meant by setting time of concrete?	2 M
5.	Define the water cement ratio.	2 M
6.	Write about gel space ratio.	2 M
7.	Define mix design of concrete	2 M
8.	What is meant by Standard deviation?	2 M
9.	List any two advantages of light weight concrete.	2 M
10.	What is meant by No- fines concrete?	2 M

PART-B
Answer any FIVE questions. One question from each unit either A or B (Compulsory)
Each question carries TEN Marks.   5x10=50M

11. A.	Explain the types of cement.	10M
	OR	
11. B.	Elaborate the testing procedure for determination of flakiness and elongation index of an aggregate.	10M
12. A.	Explain the various stages of manufacture of concrete.	10M
	OR	
12. B.	Discuss the method of test for bleeding of concrete.	10M
13. A.	Discuss the various factors affecting the strength of concrete.	10M
	OR	
13. B.	Elaborate the flexural strength test of concrete.	10M
14. A.	Explain the IS recommended method of concrete mix design	10M
	OR	
14. B.	Discuss briefly about statistical quality control of concrete.	10M

(P.T.O)

15. A. Explain are the advantages and disadvantages of Fibre reinforced concrete. 10M

OR

15. B. Discuss briefly about Self compacting concrete. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: Structural Analysis-I
(Civil Engineering)

Date: 01.08.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1. What are the limitations of method of joints?   2 M
2. State the condition for a frame to be called as perfect frame.   2 M
3. What are the advantages of arches over rectangular sections?   2 M
4. Discuss about the geometrical properties of parabolic arch.   2 M
5. Classify the different types of props.   2 M
6. Write down the compatibility conditions for a fixed beam.   2 M
7. What is the condition to apply theorem of three moments.   2 M
8. A continuous beam ABC consist span AB of 5 m loaded with uniformly distributed load of   2 M
   10 kN/m and span BC of 5 m loaded with central point load of 30 kN. If end supports are
   simple and AB is the redundant, Write the BM expression for segment AB as a origin A.
9. Write a short note on the significance of influence lines.   2 M
10. What is the absolute maximum bending moment due to moving UDL longer than the span of   2 M
    a simply supported beam.

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**
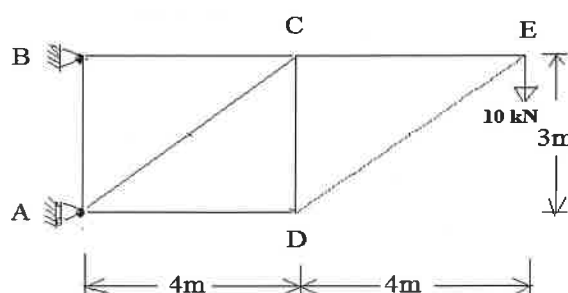
11.A). Determine the forces in the members of the truss shown in figure using method of   10M
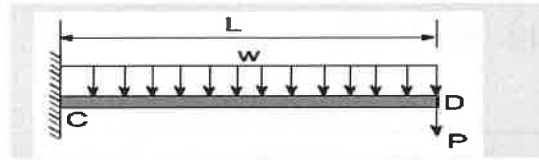   sections.
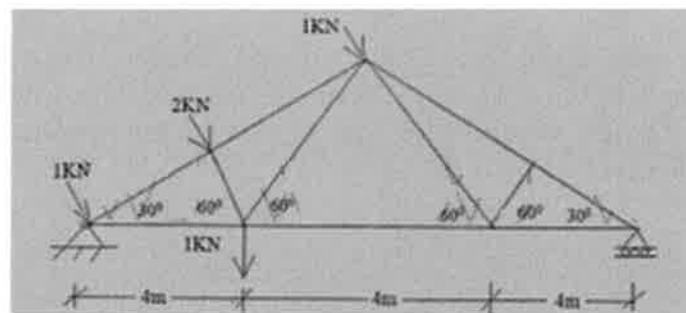
OR

11. B). Determine the forces in the truss by method of joints shown in fig   10M


(P.T.O..)

12. A). The cantilever beam CD supports a uniformly distributed Load w. and a concentrated load   10M
P as shown in figure below. If L = 3m; w = 6 kN/m; P = 6 kN and E. I = 5 MN m² determine the deflection at D using Castigliano's theorem?

OR

12. B). A three hinged parabolic arch of span 21 m has a rise of 4 m. The arch is loaded with a   10M
point load of 8 kN at a horizontal distance of 6 m from the left support. Determine the horizontal thrust, reactions and bending moment under the load.

13. A). Determine the reactions of the propped cantilever beam shown in figure.   10M
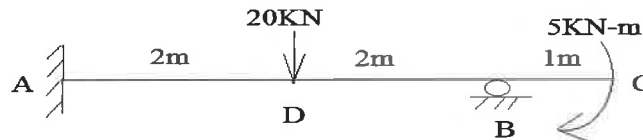
OR

13. B). A fixed beam AB of length 6 m carries point loads of 160 kN and 120 kN at a distance of   10M
2 m and 4 m from the left end 'A'. Find the fixed end moments and draw BMD.

14. A). A continuous beam of length 24 m rests on four supports covering three equal spans. It   10M
carries a uniformly distributed load of 3 kN/m per unit length. Analyze the beam using slope deflection method. Draw the bending moment diagram and shear force diagram.

OR

14. B). A two span continuous beam ABC is fixed at A and C and is continuous over B. The span   10M
AB=4.3 m and span BC=5.7m. The span AB carries a UDL of 55 kN/m and span BC carries a central point load of 42 kN. EI is constant for the whole beam. Find the moments and reactions at all supports and draw the bending moment diagram using clapeyron's theorem.

15. A). Two-point loads of 100 kN and 200 kN spaced 3 m apart cross a girder of span 12 m from   10M
left to right with 100 kN leading. Determine the maximum bending moment at a section 8 m from the right support. Also, find the location and magnitude of absolute maximum bending moment.

OR

15. B). A simply supported beam of span 24 m is subjected to a moving uniformly distributed   10M
load of length 6 m and intensity 25 kN/m. Draw the influence line diagrams for shear force and bending moment at a section 10 m from the left support. Also calculate the maximum bending moment and shear at the section.

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

Course Name: Signals & Systems

(Common for EEE & ECE)

Date: 19.07.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.   10x2=20M

1. Find the Even and Odd parts of $x(t) = u(t)$.   2 M
2. Formulate the Exponential Fourier Series coefficients.   2 M
3. Define the Dirichlet conditions of Fourier Transform.   2 M
4. State Sampling theorem.   2 M
5. Analyze the Causality and stability of given LTI system $h(t) = e^{2t}u(t-3)$ 2 M
6. Explain Paley-wiener criterion for physical realization of a system.   2 M
7. Write any two properties of Auto Correlation function.   2 M
8. Define Convolution.   2 M
9. Analyze the Laplace transform and ROC of $x(t) = e^{-2|t|}$ 2 M
10. Solve the z transform and ROC of $x(n) = (2)^n u(n) - (3)^n u(-n-1)$ 2 M

PART-B

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

11.A). i) Derive the Expression for Mean Square error.   5M

ii) Show that $e^{jm\omega_0 t}$ and $e^{-jn\omega_0 t}$ are orthogonal to each other over the interval t_0 to t_0+T 5M

OR

11. B). Develop the expression for Trigonometric Fourier Series Coefficients.   10M

12. A). i) Find the Fourier Transform of symmetrical Gate Pulse.   5M

ii) State and Prove time Differentiation property of Fourier Transform.   5M

OR

12. B). State and Prove Sampling theorem for band limited signals.   10M

13. A). i) Analyze the relationship between input, output and Impulse response of Continuous time LTI system.   5M

ii) Develop the conditions for Distortion less transmission system.   5M

OR

13. B). Determine the relation between rise time and Bandwidth.   10M

14. A). i) State and prove Convolution in time domain property.   4M

ii) State and prove any three properties of correlation.   6M

OR

14. B). i) Determine the relationship between Auto Correlation function and Energy Spectral Density.   4M

ii) Discuss how to detect Periodic signals in the presence of noise using correlation.   6M

(P.T.O..)

15. A).   i) State and prove initial value theorem of Laplace transform.   6M

           ii) Build the relationship between Laplace transform and Fourier transform.   4M

OR

15. B).   i) State and prove any three properties of z- transform.   6M

           ii) Determine the z transform of $x(n)=(a)^n \cos(\omega_0 n)u(n)$.   4M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: Electrical Machines-II
(Electrical & Electronics Engineering)

Date: 22.07.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. List the advantages of short pitched coils.   2 M
2. In a 4-pole, 3-phase alternator, armature has 36 slots. It is using an armature winding which is   2 M
   short pitched by one slot. Calculate its coil span factor.
3. What is constant magnetic field?   2 M
4. Define revolving magnetic field.   2 M
5. Compare squirrel cage and slip-ring induction motor.   2 M
6. Draw torque and slip characteristics of 3-phase induction motor.   2 M
7. Which tests are conducted to obtain equivalent circuit parameters of a single phase induction   2 M
   motor?
8. List the applications of Universal motor and stepper motor.   2 M
9. Draw 'V' and inverted 'V' curves.   2 M
10. Draw the power angle characteristics.   2 M

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

11.A). With the help of neat sketches, explain the various types of windings used in alternators.   10M

OR

11. B). Derive an expression for Coil Span factor and distribution factor.   10M

12. A). Write short notes on 3 windings spatially shifted by 120 degrees carry 3-phase balanced   10M
    current.

OR

12. B). Write short notes on windings spatially shifted by 90 degrees and addition of pulsating   10M
    magnetic fields.

13. A). What are the types of starting methods of three phase induction motor and explain any   10M
    one of them.

OR

13. B). A 15 kW, 400V, 4-pole, 50Hz, 3-phase star-connected induction motor gave the following   10M
    test results:

	No-load test data	Blocked rotor test
Line Voltage	400V	200V
Line current	9A	50A
Power input	1310 watts	7100 watts

Stator and rotor ohmic losses at standstill are assumed equal.
Draw the induction motor circle diagram and calculate
(i) Line current, power factor, slip, torque, and efficiency at full load.
(ii) Slip at which maximum torque occurs, maximum torque and starting torque.

(P.T.O..)

14. A). Explain the double revolving field theory.   10M

OR

14. B). Write short notes on Universal motor and Stepper motor.   10M

15. A). List the different types of methods for starting of synchronous motor and explain all these   10M
types.

OR

15. B). What are the methods to suppress hunting and explain all these types?   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: Power Systems-I
(Electrical & Electronics Engineering)

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Write about condenser of a thermal power station.	2 M
2.	List the advantages of Pressurized Water Reactor (PWR).	2 M
3.	Define Solar Constant.	2 M
4.	List the advantages and disadvantages of wind energy.	2 M
5.	Distinguish between feeder and distributor.	2 M
6.	Discuss the advantages of ring main distributor.	2 M
7.	What are the limitations of Indoor substation?	2 M
8.	Enumerate the causes of low power factor.	2 M
9.	What are base and peak load plants and give their significance.	2 M
10.	Define Simple rate, Flat Rate Tariff.	2 M

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

11.A). With a neat diagram explain the operation of Hydroelectric power plant.   10M

OR

11. B). Describe with neat sketches the construction and operation of (i) Boiling Water Reactor (BWR) and (ii) Fast Breeder Reactor (FBR).   10M

12. A). i) Discuss about wind energy potential in India and its growth scenario.   5M
ii) What are the environmental benefits of using biomass?   5M

OR

12. B). What are various types of digesters in practice for anaerobic digestion of solid organic wastes? Explain the working of any one type.   10M

13. A). A 2-wire DC ring distributor is 300m long and is fed at 240V at point A. At point B, 150m from A, a load of 120A is taken and at C, 100m in the opposite direction, a load of 80A is taken if the resistance per 100m of single conductor is 0.03, find   10M
i) current in each section of distributor
ii) voltage at points B and C

OR

13. B). A single phase distributor one kilometer long has resistance and reactance per conductor of 0.1 Ω and 0.15 Ω respectively. At the far end, the voltage $V_B = 200$ V and the current is 100 A at a p.f. of 0.8 lagging. At the mid-point M of the distributor, a current of 100 A is tapped at a p.f. of 0.6 lagging with respective to the voltage at the mid-point. Calculate: 10M
i) Voltage at mid-point
ii) Sending end voltage V_A
iii) Phase angle between V_A and V_B.

(P.T.O..)

14. A). i) Discuss the method of voltage control by using tap changing transformers. 5M

ii) List the different types of Gas insulated substations and explain any one type with a neat lay out diagram. 5M

OR

14. B). Derive the expression for most economical power factor considering the following cases. 10M

(i) Most economical power factor when KW demand is constant

Most economical power factor when KVA demand is constant

15. A). i) Describe the desirable characteristics of tariff. 5M

ii) An industrial consumer has a maximum demand of 120 kW and maintains a load of 80%. The tariff in force is Rs. 60 per kVA of maximum demand plus 8 paise per unit. If the average p.f. is 0.8 lagging, calculate the total energy consumed per annum and the annual bill. 5M

OR

15. B). A Power system has following load particulars. 10M

	Maximum Demand	Load Factor	Diversity between the consumers
Residential Load	1000 kW	0.3	1.2
Commercial Load	2000 kW	0.4	1.1
Industrial Load	4000 kW	0.7	1.3

Overall diversity factor may be taken as 1.4.

(i) Maximum demand on the system, (ii) Daily energy consumption (total).

(iii) Overall load factor, and (iv) Connected load (total) assuming that demand factor for each load is unity

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

Course Name: Network Theory-II

(Electrical & Electronics Engineering)

Date: 26.07.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.   **10x2=20M**

1. Discuss about the concepts of phase sequence.   2 M
2. Write the relationship between line voltage and phase voltages in delta connected system.   2 M
3. Why the voltage drop across the capacitor does not change instantaneously.   2 M
4. What is transient response for R-L circuit using DC excitation.   2 M
5. State the properties of positive real function.   2 M
6. List the necessary conditions of driving point function.   2 M
7. Mention the applications of hybrid parameters and ABCD parameters.   2 M
8. Write the expressions for transmission parameters of two two-port networks in Z parameters.   2 M
9. Discuss wave symmetry? List out various types of symmetry.   2 M
10. List any three properties of Fourier Transform.   2 M

PART-B

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

11.A). Derive the relation between phase and line current and phase and line voltage of the Star connected balanced system.   10M

OR

11. B). For a balanced three phase, three wire system with star connected load for which line voltage is 230V and per phase resistance and reactance is 6 ohms and 8 ohms respectively. Calculate line current and power absorbed by each phase.   10M

12. A). Derive an expression for current in a series R-C circuit excited by DC voltage.   10M

OR

12. B). A sinusoidal voltage v(t) =Vsin 100πt is applied at t = 0.02 seconds to a series R-Lcircuit, where R=20 ohms and L=0.2 H. Calculate the ratio of maximum value of current (to which it rises) to the steady state value of current.   10M

13. A). Test whether F(S)=(S+8)(S+2)/(S+4)(S+6) is positive real function.   10M

OR

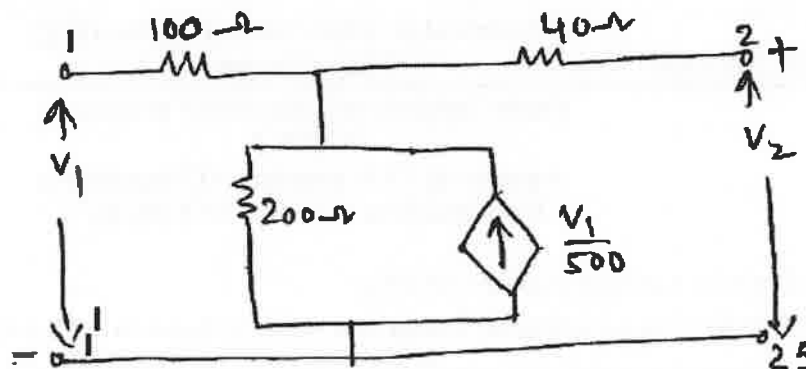13. B). State the properties of transform function and properties of Driving point function.   10M

14. A). Explain hybrid parameters and transmission parameters.   10M

OR

(P.T.O..)

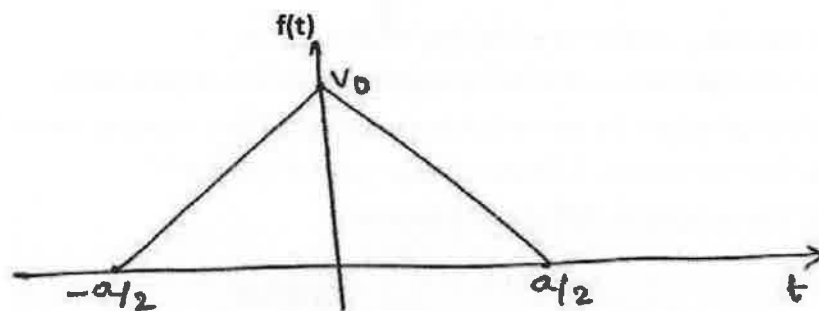14. B).   Solve Y – parameters of the network shown.   10M

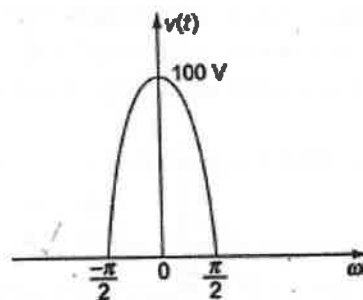15. A).   Find the Fourier transform of the triangular wave shown in figure.   10M

OR

15. B).   Determine the Fourier series expansion of the given wave form.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August -2024
Subject Name: Switching Theory & Logic Design
(Electrical & Electronics Engineering)

Date: 30.07.2024　　　　　Time: 3 hours　　　　　Max.Marks:70

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.　　　　　**10x2=20M**

1. Express following number in Binary $(DADA.B)_{16}$　　　2 M
2. Show that the dual of the Exclusive – OR is equal to its complement.　　　2 M
3. Simply the Boolean function $F(X, Y,Z)=\sum(3,4,6,7)$ using Karnaughmap and draw logic diagram for simplified expression?　　　2 M
4. Define SOP, POS and Don't care conditions　　　2 M
5. Write the Truth table for SR and T-FlipFlop.　　　2 M
6. What is binary cell.　　　2 M
7. What is redundancy.　　　2 M
8. Define strongly connected state machine and Successor.　　　2 M
9. Write shortnotes on incompletely specified state machine　　　2 M
10. What is Melay model.　　　2 M

PART-B
Answer any FIVE questions. One question from each unit either A or B (Compulsory)
Each question carries TEN Marks.　　　　　**5x10=50M**

11. A. a) Determine the value of base x, if $(211)_x = (152)_4$.　　　3M
b)Why a NAND and NOR gates are known as universal gates? Simulate all the basic Gates.　　　5M
c) Find the duality of the following Boolean expression $Y = (x'y+x'z)'+y$　　　2M

OR

11. B. Generate hamming code of 10101101 using even parity bit.　　　10M

12. A. . Minimize the following expressions using K-map and realize it using NAND Gates. $f = \sum m (1, 3, 5, 8, 9, 11, 15) +d (2, 13)$.　　　10M

OR

12. B. Design a code converter that converts a decimal digit from the Gray code to Binary code　　　10M

13. A. Convert the following flipflops i) JK flip-flop to T flip-flop ii)D flip-flop to T flip-flop.

(P.T.O)　　　10M

OR

13. B. i). Explain about JK-Flip flap with negative edge triggering. 6M
        ii) Comparison between Combinational and Sequential circuits. 4M

14. A. Design a MOD-5 Synchronous counter using JK flip-flop.
        10M

OR

14. B. Design a sequential circuit for a state diagram shown in Fig(i) using T flip-flop. 10M
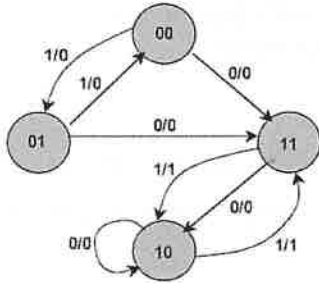
fig(i)

15. A. Reduce the state table using Merger graph method.

PS	NS,Z			
	I1	I2	I3	I4
A	- -	E,1	B,1	- -
B	- -	D,1	- -	F,1
C	F,1	- -	- -	- -
D	- -	- -	C,1	- -
E	C,0	- -	A,0	F,1
F	D,0	A,1	B,0	- -

10M

OR

15. B. Draw the ASM chart for Binary Multiplier.
        10M

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

Date: 22.07.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define the term viscosity and write its units in CGS.	2 M
2.	What is the influence of the vapour pressure in the fluid flow?	2 M
3.	Differentiate the laminar and turbulent flow.	2 M
4.	What ae the assumptions of Bernoulli's equation applicable between any two points in a flow field?	2 M
5.	Define Reynold's Number.	2 M
6.	Describe the separation of boundary layer.	2 M
7.	What is meant by the impact of Jet ?	2 M
8.	Classify the turbines based on the inlet energy.	2 M
9.	Identify the important parts of the Centrifugal pump?	2 M
10.	Define NPSH.	2 M

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

11.A).	Calculate the specific gravity of the fluid flowing over a flat plate, if 1.5 N force is required to pull a thin plate of surface area 1 m^2 at constant velocity. Thin plate is 0.5 m apart from the flat plate. Kinematic viscosity of the fluid is 6 stokes and velocity profile generated for the movement of thin plate is $u = 3y-y^2$.	10M

OR

11. B).	Define and derive an expression for surface tension on a liquid droplet.	10M
12. A).	Derive the Bernouli's equation for fluid flow.	10M

OR

12. B).	Water is flowing through a pipe having diameter 300 mm and 200 mm at the bottom and upper end respectively. The intensity of pressure at the bottom end is 24.525 N/cm^2 and the pressure at the upper end is 9.81 N/cm^2. Determine the difference in datum head if the rate of low through pipe is 40 lit/sec.	10M
13. A).	Derive Darcy-Weisbach equation.	10M

OR

13. B).	An oil of sp. Gravity 0.7 is flowing through a pipe of diameter 300 mm at the rate of 500 lit/sec. Find the head lost due to friction and power required to maintain the flow for a length of 1000 m take kinematic viscosity = 0.29stokes.	10M

(P.T.O..)

14. A). Explain the working of Kaplan turbine with neat sketch. 10M

OR

14. B). A Pelton wheel is to be designed for the following specifications. Power = 735.75 Kw. Specific Head = 200 m, speed = 800 rpm. Overall efficiency = 0.86 and jet dia. is not to exceed one tenth of the wheel dia. determine (i) wheel diameter (ii) the no. of jets required (iii) Dia. of jet. C_v = 0.98 and speed ration = 0.45. 10M

15. A). Explain the importance of Characteristics curves of the pump with neat sketch. 10M

OR

15. B). Explain the working of single acting reciprocating pump with neat sketch. 10M

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

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. What are the different kinds of fuels used in an internal combustion engine?   2 M
2. What is meant by compression ratio?   2 M
3. What is the normal combustion and abnormal combustion in SI engine?   2 M
4. What are anti-knock agents? Main difference between working of anti-knock agent in SI and CI.   2 M
5. What are the various losses of IC Engine?   2 M
6. Define brake power.   2 M
7. Classify positive displacement compressors.   2 M
8. Mention the primary element of axial compressor.   2 M
9. What is dry bulb temperature?   2 M
10. List the merits of air refrigeration.   2 M

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

11.A). Explain the working of simple carburetor with neat sketch.   10M

OR

11. B). Why do we feel the necessity of cooling an IC engine? Explain briefly the following methods of cooling IC engines: Air-cooling and Liquid - cooling?   10M

12. A). Differentiate between normal combustion and abnormal combustion phenomena in case of SI Engine.   10M

OR

12. B). Explain in detail the stages of combustion in CI engine.   10M

13. A). What is the significance of heat balance sheet? Discuss the procedure to draw heat balance sheet for CI engine?   10M

OR

13. B). An Otto cycle four stroke gas engine has a cylinder 25cm in diameter and the stroke of the piston is 40cm. It operates under the following conditions: Speed=200rpm, misfires per minute =10, Mean effective pressure=6.2kg/cm², Mechanical efficiency =80%
Determine (a) IP, (b) BP and (c) Friction power.   10M

14. A). Describe with a neat sketch the construction and working of a single-stage single-acting reciprocating air compressor. **10M**

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

14. B). A Centrifugal compressor used as a super charger for aero-engines handles 150 kg/min of air. The suction pressure and temperature are 1bar and 290K. the suction velocity is 80 m/s. after compression in the impeller the conditions are 1.5bar 345K and 220 m/s. Calculate: **10M**
a) Isentropic efficiency
b) power required to drive the compressor
c) The overall efficiency of the unit.
It may be assumed that K.E. gained in the impeller is entirely converted into pressure in the diffuser.

15. A). Explain the functions of the following parts of a simple vapour compression system: compressor, condenser, expansion valve and evaporator. **10M**

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

15. B). An air refrigeration system operates between 1 MPa and 200 K Pa is required to produce a cooling effect of 3000 kJ/min. Temperature of the air leaving the cold chamber is -5 °C and at leaving the cooler is 40 °C. Neglect losses and clearance in the compressor and expander determine (i) Mass of air circulated per min (ii) Compressor work, expander work, cycle work. (iii) COP and power in kW required. **10M**

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

Date: 26.07.2024 AN   Time: 3 hours   **Max.Marks: 70**

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1. What are the desirable properties of moulding sand?   2 M
2. What are the materials used to make pattern?   2 M
3. What is the effect of temperature in metal forming process?   2 M
4. What is the difference between punching and blanking?   2 M
5. What are the factors affecting tool life?   2 M
6. Which are the four most important characteristics of the materials used to manufacture cutting tools?   2 M
7. List the significant disadvantages of additive manufacturing.   2 M
8. What is adhesive bonding?   2 M
9. How to minimize tool wear in EDM?   2 M
10. List out various types of lasers used in LBM process   2 M

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

11.A). Explain investment casting process with a neat sketch.   10M

OR

11. B). Describe casting defects and their causes and remedies in detail. 10M

12. A). Distinguish between hot working and cold working.   10M

OR

12. B). i) Explain forward extrusion and backward extrusion with neat sketches.   5M
ii) Distinguish between bending and drawing in sheet-metal operations.   5M

13. A). i) Explain the geometry of a single point cutting tool with a neat sketch.   5M
ii) Explain the effect of machining parameters on surface finish.   5M

OR

13. B). Briefly explain the different types of chips produced during metal cutting with neat sketches.   10M

14. A). Explain the advantages and applications of additive manufacturing process.   10M

OR

14. B). Explain any one of the solid state joining process with a neat sketch.   10M

15. A). Explain ultrasonic machining process with a neat sketch.   10M

OR

15. B). Explain process parameters, advantages and limitations of Electron beam machining.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August -2022
Course Name: Kinematics of Machinery
(Mechanical Engineering)

Date:30.07.2024 AN | Time: 3 hours | Max.Marks:70

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks. | 10x2=20M

1.	Explain the terms: a) Lower pair, b) Higher pair	2 M
2.	Differentiate between machine and a mechanism	2 M
3.	What is Coriolis component of acceleration?	2 M
4.	Illustrate the instantaneous centers of a typical four bar mechanism.	2 M
5.	What do you mean by straight line mechanism?	2 M
6.	Describe the use of Double Hooke's joint	2 M
7.	State the basic requirements for high speed cams?	2 M
8.	Why is the roller follower extensively used?	2 M
9.	State the law of gearing.	2 M
10.	Define the following terms used in gear: (a) Pressure angle (b) Module.	2 M

PART-B
Answer any FIVE questions. One question from each unit either A or B (Compulsory)
Each question carries TEN Marks. | 5x10=50M

11. A.   i) Classify the kinematic pairs based on the various characteristics.   **5M**
ii) Sketch slider crank chain and its various inversions, stating actual machines in which these are used in practice   **5M**

OR

11. B.   Explain the types of constrained motions of mechanism.   **10M**

12. A.   For the inverted slider-crank mechanism shown in Figure.1, determine the angular velocity and angular acceleration of the link BC and the sliding velocity of the block on the link BC .The crank OA is 200 mm long and rotates at 30 rad/s in the clockwise direction. OB is 600 mm and angle BOA = 40°   **10M**
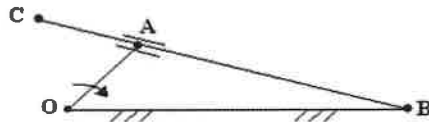
OR

12. B.   Locate all instantaneous centers of the slider crank mechanism; the length of crank OB and Connecting rod AB are 125 mm and 500 mm respectively. The crank speed is 600 rpm clockwise. When the crank has turned 45° from the IDC. Determine (i) velocity of. slider' A' (ii)Angular Velocity of connecting rod 'AB'.   **10M**

13. A. What are straight line motion mechanisms? Describe one type of exact straight line motion mechanism with the help of a sketch. 10M

OR

13. B. Two inclined shafts are connected by means of a universal joint. The speed of the driving shaft is 1000 r.p.m. If the total fluctuation of speed of the driven shaft is not to exceed 12.5% of this, what is the maximum possible inclination between the two shafts? With this angle, what will be the maximum acceleration to which the driven shaft is subjected and when this will occur? 10M

14. A. Deduce the expressions for displacement, velocity and acceleration for a circular arc cam operating a flat-faced follower
a) when the contact is on the circular flank, and
b) when the contact is on circular nose 10M

OR

14. B. A cam operating a knife - edged follower has the following data:
(i) Follower moves outwards through 40mm during 60^0 of cam rotation.
(ii) Follower dwells for the next 45^0.
(iii) Follower returns of its original position during next 90^0.
(iv) Follower dwells for the rest of the rotation. The displacement of the follower is to take place with simple harmonic motion during both the outward and return strokes. The least radius of the cam is 50mm. Draw the profile of the cam when the axis of the follower is offset 20mm towards right from the cam axis. If the cam rotates at 300 r.p.m., Calibrate maximum velocity and acceleration of the follower during the outward stroke and the return stroke. 10M

15. A. A pinion of 20 involute teeth and 125 mm pitch circle diameter drives a rack. The addendum of both pinion and rack is 6.25 mm. Analyze the least pressure angle which can be used to avoid interference? With this pressure angle, find the length of the arc of contact and the minimum number of teeth in contact at a time. 10M

OR

15. B. In a reverted epicyclic gear train, the arm A carries two gears B and C and a compound gear D - E. The gear B meshes with gear E and the gear C meshes with gear D. The number of teeth on gears B, C and D are 75, 30 and 90 respectively. Find the speed and direction of gear C when gear B is fixed and the arm A makes 100 r.p.m. clockwise 10M

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

Date: 22.07.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.　　　　　　　　**10x2=20M**

1.	What are various types of coupling methods used in multistage amplifiers.	2 M
2.	What is the concept of feedback in amplifiers?	2 M
3.	Draw the h-parameter model of BJT.	2 M
4.	What is CE Short circuit current gain?	2 M
5.	Classify large signal amplifiers.	2 M
6.	What is thermal stability in power amplifiers.	2 M
7.	Classify the clamper circuits	2 M
8.	State clamping circuit theorem.	2 M
9.	Mention two applications of Astable Multivibrators.	2 M
10.	Mention different methods of triggering a bistable multivibrator.	2 M

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

11.A).	Draw the circuit diagram, equivalent circuit of a Darlington pair and derive expressions for overall voltage gain and input impedance.	10M

OR

11. B).	Show that current-series negative feedback increases the input impedance and increases the output impedance. Mention the advantages of negative feedback.	10M
12. A).	Discuss about the effect of Coupling and bypass capacitors on low frequency response of BJT Amplifiers	10M

OR

12. B).	Draw the hybrid-π model of common emitter configuration and describe each component in the π-model	10M
13. A).	i) What is Harmonic distortion in transistor amplifier circuits?	5M
	ii) Write short notes on requirement and types of heat sinks for power dissipation in large signal amplifiers.	5M

OR

13. B).	Draw the circuit and explain the working principle of a Class-B complementary symmetry push-pull power amplifier and state its disadvantages.	10M
14. A).	Sketch the response of High pass and low pass RC circuit for step input and derive the expression for rise time.	10M

OR

14. B).	Explain the working of a two-level diode clipper with the help of circuit diagram, waveforms and transfer characteristics.	10M

(P.T.O..)

15. A). Describe monostable multivibrators from the viewpoints of construction, principle of working and calculate the pulse width of monostable multivibrators. 10M

OR

15. B). i) Draw a Schmitt Trigger using transistors and derive for UTP & LTP. 5M

ii) Why collector catching diodes are used in multi vibrators. 5M

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

Course Name: Analog & Digital Communications
(Electronics & Communication Engineering)

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1. What is the percentage of power saving in SSB-SC at $m_a=0.6$?   2 M
2. Design an envelope detector to demodulate AM signal s(t) = $5[1+0.7 \ Cos(2\pi x10^3t)]$ $Cos(2\pi x10^6t)]$ 2 M
3. Phase modulation is not used for broadcasting. Why?   2 M
4. Frequency Modulation is voltage to frequency converter. How?   2 M
5. What is Aperture effect?   2 M
6. What are the advantages of differential Quantization?   2 M
7. Draw the block diagram for FSK?   2 M
8. What are the advantages of PSK over ASK & FSK?   2 M
9. Under what condition Channel capacity is maximum?   2 M
10. A Gaussian Channel has I MHz bandwidth. Calculate the Channel capacity if signal power to noise PSD is 10^5 Hz?   2 M

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

11.A). i) Discuss the effect of the Frequency error in the detection of SSB-SC Signal?   5M
ii) Draw the frequency Spectrum of AM signal for voice signal and find the Band width (BW)?   5M

OR

11. B). i) SSB-SC modulation Technique is used to transmit the Voice signal. Explain with neat sketches in frequency domain.   7M
ii) Compare AM-FC with AM-SC.   3M

12. A). Prove that WBFM is non- linear modulation Technique.   10M

OR

12. B). Explain about super heterodyne receiver in detail.   10M
13. A). What are the draw backs in DM and how they over come in Adaptive DM?   10M

OR

13. B). Discuss the demodulation of PWM & PPM with neat sketches.   10M
14. A). Matched filter maximize the signal to Noise Ratio. Explain   10M

OR

14. B). Derive the expression for probability of error in FSK.   10M
15. A). What is Huffman coding? Explain with one example.   10M

OR

15. B). i) Compare source coding and Channel Coding   5M
ii) What is Shannon-Fano coding? Explain with on example.   5M

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

Date: 26.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define Continuity equation.	2 M
2.	Define convection and conduction currents.	2 M
3.	Define scalar and vector magnetic potentials.	2 M
4.	Define the Maxwell equations in integral form.	2 M
5.	State the Poynting theorem.	2 M
6.	Define parallel and vertical polarizations.	2 M
7.	What are the advantages of loading?	2 M
8.	Define loss less line and mention the primary and secondary constants at this Condition.	2 M
9.	List the parameters to find using Smith chart.	2 M
10.	A $\lambda/4$ length transmission line having impedance Z_0 is terminated with Z_R, What is the input impedance?	2 M

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

11.A).   i) Point charges 1mC and -2mC are located at (3,2,-1) and (-1,-1,4), respectively. Calculate the electric force on a 10nC charge located at (0, 3, 1) and the electric field intensity at that point?   6M

ii) Explain Coulumb's Law   4M

OR

11. B).   i) The point Charges -1nc , 4nC, and 3nC are located at (0,0,0) ,(0,0,1) and (1,0,0), respectively . Find the potential in the System.   7M

ii) Define Isotropic, Linearity of dielectric materials.   3M

12. A).   i) State and explain the boundary conditions.   7M

ii) Mention the applications of Ampere's law.   3M

OR

12. B).   i) Explain the concept of Magnetic vector potential.   6M

ii) Write Maxwell's equations in different final forms.   4M

13. A).   What are the characteristics of plane Wave? A manufacturer produces a ferrite material with $\mu=750\mu_0$, $\varepsilon=5\varepsilon_0$, and $\sigma=10^{-6}$ S/m at 10MHz. i) Would you classify the material as lossless, lossy, or conducting, ii)Calculate β and λ.   10M

OR

13. B).   Derive the expression for reflection of plan wave at normal incidence.   10M

14. A). Derive the expression for Transmission line. 10M

OR

14. B). i) A short circuited Coaxial transmission line has Z_0=60 ohms and γ=j8.5/m. Calculate the input impedance, if $\lambda/8$ length of the line. 3M

ii) A lossy transmission line has R=3.5 ohms/m, L=2μH/m, C=120pF/m, and G=0 at 400MHz, determine α, β, Zo. 7M

15. A). i) Applications of smith chart. 5M

ii) Explain short and open circuit impedance. 5M

OR

15. B). Explain how single stub is used for matching with suitable diagram. 10M

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

(Electronics and Communication Engineering)

Date: 30.07.2024 AN   Time: 3 hours   Max.Marks:70

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define Control System, Classify the types of control systems	2 M
2.	Define sensitivity & stability related to control systems	2 M
3.	Define the characteristics equation of armature-controlled DC motor	2 M
4.	List the disadvantages of Block diagram reduction	2 M
5.	List the standard test signals in time response analysis	2 M
6.	List the time response parameters of a second-order system	2 M
7.	Sketch the bode plot for $G(s) = 10$	2 M
8.	List the applications of the Nyquist stability criterion	2 M
9.	Define Controllability & Observability in terms of the state space model	2 M
10.	Define State, State variable, and state model	2 M

PART-B
Answer any FIVE questions. One question from each unit either A or B (Compulsory)
Each question carries TEN Marks.   5x10=50M

11. A.   Explain the need of a feedback control system with an example   10M

OR

11. B.   Explain the differences between Open loop and closed loop control systems in detail.   10M

12. A.   Derive the Transfer function $\frac{\theta(s)}{Ea(s)}$ of Armature controlled DC servo motor   10M

OR

12. B.   Apply Mason's gain formula to find the transfer function of the system shown below   10M
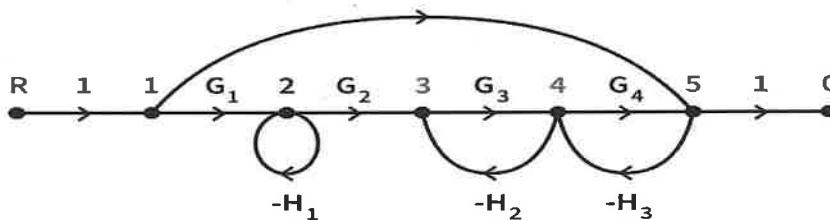
13. A.   Determine the parameters (i) Rise Time (ii) Peak Time (iii) Settling Time (iv) Peak Overshoot (v) Steady state error for the unit step input applied to the transfer function $G(S) = \frac{100}{(s^2+s+100)}$ 10M

(P.T.O)

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

13. B. Elaborate different types of stability. Determine the stability of a unity feedback   10M
system whose open loop transfer function is $G(S) = \frac{100}{s(s+100)}$ using RH-criterion.

14. A. Determine the following parameters (i) Resonant Peak (ii) Resonant Frequency (iii)   10M
Bandwidth (iv) Phase margin (v) Gain Margin for the unity feedback system whose
open loop transfer function $G(s) = \frac{0.5}{(s^2+3s+2)}$

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

14. B. Sketch the Bode plot and determine the Gain margin and phase margin for the   10M
transfer function is given, $G(s) = \frac{10}{s(0.4s+1)(0.1s+1)}$.

15. A. Determine whether the given system is controllable or observable   10M

$$\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \end{bmatrix} = \begin{bmatrix} -3 & -1 \\ -2 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t); \ y = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$$

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

15. B. A system is characterized by the following state space equations   10M

$$\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \end{bmatrix} = \begin{bmatrix} -3 & -1 \\ -2 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t); \ y = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$$

Determine the complete response for a unit step input with zero initial
conditions.

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

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

Course Name: Design & Analysis of Algorithms
(Common for CSE, IT, CSM, AID & AIM)

| Date: 22.07.2024 AN | Time: 3 hours | Max.Marks: 70 |

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. Define time complexity and space complexity.   2 M
2. What is an algorithm? explain the characteristics of algorithm.   2 M
3. List out the application of Divide and Conquer method.   2 M
4. Write the applications of Dynamic programming.   2 M
5. Outline the N – Queens's problem.   2 M
6. Make use of methodology of Branch and Bound.   2 M
7. What is spanning tree?   2 M
8. Extend the Transitive closure.   2 M
9. Distinguish the Tractable and Intractable problems.   2 M
10. Define NP complete problem.   2 M

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

11.A). What are the Asymptotic notations? And give its properties.   10M

OR

11. B). Distinguish the recursive and non-recursive binary search algorithm with example.   10M

12. A). Explain how divide and conquer method is used to implement Merge sort technique with its Time Complexity.   10M

OR

12. B). Show the non-deterministic algorithm for knapsack problem with Example.   10M

13. A). Demonstrate the 8-queens problem using backtracking method.   10M

OR

13. B). Discuss and Draw the portion of state space tree generated by FIFOBB for the following instance of 0/1 knapsack n= 5, M=12, (p1, ...p5) = (10,15,6,8,4) (w1,. ... w5)=(4,6,3,4,2)   10M

14. A). Compute all pair shortest path for following graph shown in figure 1.   10M
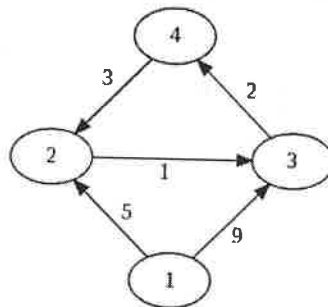

figure 1

(P.T.O..)

OR

14. B). Compare and Contrast the BFS and DFS.   10M

15. A). Explain in detail about the classes of NP-hard and NP-complete.   10M

OR

15. B). With example Identify the Reduction Techniques.   10M

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R18

Hall Ticket No. ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚   **Question Paper Code: A30525**

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

Date: 24.07.2024 AN	Time: 3 hours	Max.Marks: 70

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1.	What are the characteristics of the software?	2 M
2.	Define software process?	2 M
3.	What is cardinality in data modeling?	2 M
4.	What are the characteristics of SRS?	2 M
5.	Differentiate is the data modeling and data object?	2 M
6.	Distinguish between forward and reverse engineering	2 M
7.	Give a note on art of Debugging?	2 M
8.	Outline the levels of testing?	2 M
9.	What is software quality assurance?	2 M
10.	What are the Features supported by SCM?	2 M

PART-B
Answer any FIVE questions. One question from each unit either A or B (Compulsory)
Each question carries TEN Marks.   **5x10=50M**

11. A.	Explain the following:	
	(i) Water fall model	5M
	(ii) Spiral Model.	5M

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

11. B.	(i) Give an overview of unified process model.	5M
	(ii) Write detailed notes on CMMI.	5M

12. A.	Explain in detail about behavioral Modeling.	10M

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

12. B.	(i) Briefly Explain Software design process	5M
	(ii) Summarize the concept of conducting component level design	5M

13. A.	Explain sequence and collaboration diagrams with suitable examples?	10M

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

13. B.	Discuss conceptual model of the UML in detail.	10M

(P.T.O)

14. A.   Discuss in detail about testing strategies?   10M

OR

14. B.   (i) Differentiate between regression and integration testing.   5 M
         (ii) What is software metric? Explain the importance of it in detail.   5 M

15. A.   List out various empirical estimation models and explain in detail.   10M

OR

15. B.   (i) Write a short note on software configuration management?   5M
         (ii)Mention and explain the Elements of SCM?   5M

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: Basic Electrical Engineering
(Common for CSE, IT, CSC, CSD & AID)

Date: 26.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. Explain Kirchhoff's Voltage Law.   2 M
2. Write the V-I relations for the Passive elements.   2 M
3. An alternating current is given by $i = 141.4 \sin(314t+30^0)$ A   find a) maximum   2 M
   Current b) Frequency.
4. List the Advantages of the three phase systems.   2 M
5. Define Back emf in a DC motor?   2 M
6. An 8-pole, lap wound armature has 1200 conductors and flux per pole of 0.02 Wb. Determine   2 M
   the generated emf when running at 600 rpm
7. A 25 KVA transformer has 250 turns on the primary and 50 turns on secondary. The primary   2 M
   connected to 1100 V,50 Hz mains. Find the primary current.
8. List the Assumptions of an Ideal Transformer.   2 M
9. A 4 pole ,3-phase induction motor runs at 1740 r.p.m.Find the slip if supply frequency is   2 M
   60Hz.
10. Classify different types of 1-ϕ induction motors.   2 M

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

11.A). State and Explain Superposition theorem with an example.   10M

OR

11. B). For the circuit shown in fig. Solve for node voltages v_1 & v_2.   10M
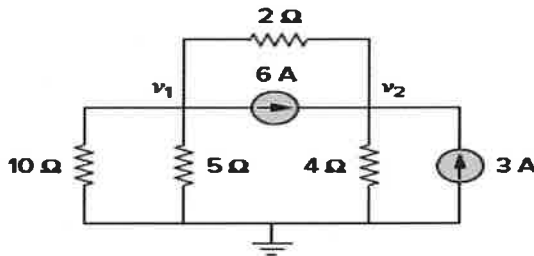
12. A). Find the RMS value and Average value of the sinusoidal waveform.   10M

OR

12. B). A three phase balanced delta connected load of 5+j10 Ω/phase is supplied from 415 volts   10M
        ,50Hz balanced 3 phase power supply Solve i) Line current ii) phase current iii) power
        factor iv) Active power v) Reactive power vi) Apparent power. Also draw phasor
        diagram.

(P.T.O..)

13. A). Classify different types of DC Generators in detail.   10M

OR

13. B). A 10 KW,250 V D.C shunt machine has an armature resistance as 0.1 Ω and field   10M
resistance of 100 Ω. Determine the armature power developed when i) it runs as a
generator delivering 10 KW   ii) it runs as a motor taking an input of 10 KW.

14. A). Explain the working principle of a transformer and derive the e.m.f equation of a   10M
transformer.

OR

14. B). The no-load current of a transformer is 5A at 0.3 p.f. lagging when supplied at 230 V, 50   10M
Hz. The number of turns on the primary winding is 200. Determine (i.) the maximum
value of flux in the core (ii.) the core loss and (iii.) the magnetizing current.

15. A). Explain the construction details and principle of operation of 3-phase induction motor.   10M

OR

15. B). Explain briefly about single phase induction motors with the help of neat circuit diagrams.   10M

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

Course Name: Cyber Security

(CSC)

Date: 22.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. Who are Computer Criminals?   2 M
2. Define IP spoofing.   2 M
3. List out cyber security Regulations.   2 M
4. Interpret the need for Computer Forensics.   2 M
5. Conclude the attacks on Mobile Phones.   2 M
6. Outline the organizational measures for handling Mobile.   2 M
7. Identify security and privacy implications.   2 M
8. Analyze the perils for organizations.   2 M
9. Determine the privacy policies.   2 M
10. Identify the importance of intellectual property in the cyberspace.   2 M

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

11.A). Explain Software attacks, hardware attacks.   10M

OR

11. B). Summarize the Security Models.   10M

12. A). How digital forensics science is utilized in cyber forensics? Explain.   10M

OR

12. B). Explain the forensics analysis of email.   10M

13. A). Discuss credit card frauds in mobile and wireless computing Era.   10M

OR

13. B). List and explain security implications for organizations.   10M

14. A). Relate cybercrimes and IPR issues.   10M

OR

14. B). Explain social computing and the associated challenges for organizations.   10M

15. A). Analyze Cyber terrorism.   10M

OR

15. B). Predict the privacy issues in financial domain.   10M

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

Course Name: Computer Networks

(Computer Science & Engineering)

Date:30.07.2024   Time: 3 hours   Max.Marks:70

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	What do you mean by computer network?	2 M
2.	Describe fiber optics.	2 M
3.	Data link protocols almost always put the CRC in a trailer rather than in a header. Why?	2 M
4.	What is the band rate of the standard 10 Mbps Ethernet?	2 M
5.	List the limitations of Distance Vector and Shortest path routing algorithms.	2 M
6.	Write about the quality of service.	2 M
7.	Write the services provided to the transport layer.	2 M
8.	If UDP is so powerless, why would a process want to use it?	2 M
9.	Write short note on WWW.	2 M
10.	List the two uses of the DNS.	2 M

PART-B
Answer any FIVE questions. One question from each unit either A or B (Compulsory)
Each question carries TEN Marks.   5x10=50M

11. A. List and explain the four levels of addressing employed in TCP/IP protocols.   10M

OR

11. B. Explain the differences between a passive star and an active repeater in a fiber network.   10M

12. A. A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system (all stations together) produces
i. 1000 frames per second.
ii. 500 frames per second.
iii. 250 frames per second   10M

OR

12. B. Mentioning the advantages and disadvantages, explain sliding window protocol using Go back n and using selective repeat.   10M

13. A. What is congestion? State and explain the general principles of congestion control.   10M

OR

13. B. List and explain the goals and characteristics of routing algorithms.   10M

(P.T.O)

14. A. With the help of neat diagram, explain the Data flow and flow control feedback in   10M
        TCP.

OR

14. B. Difference between TCP and UDP protocols.   10M

15. A. Which protocol is mostly used to transfer mails? Explain the working of protocol   10M
        in detail.

OR

15. B. With the help of common scenario explain the architecture of e-mail.   10M

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

Course Name: Machine Learning

(CSM)

Date: 19.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Differentiate supervised and unsupervised learning.	2 M
2.	What is Vapnik-Chervonekis (VC) dimension?	2 M
3.	What are the losses in Bayesian classification?	2 M
4.	Write about discriminant functions in Bayesian classification.	2 M
5.	What are the similarity measures used in clustering process?	2 M
6.	What is factor analysis in dimensionality reduction?	2 M
7.	What is Gini Index in decision tree?	2 M
8.	What is pruning?	2 M
9.	What is the need of activation function in back propagation.	2 M
10.	How can you train a perceptron?	2 M

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

11.A).	Explain about regression techniques that are used in the machine learning.	10M
	OR	
11. B).	Describe about reinforcement learning techniques with suitable examples.	10M
12. A).	Explain about support vector machine(SVM) classification with simple examples.	10M
	OR	
12. B).	Explain about model selection procedures that are used in the classification.	10M
13. A).	Briefly explain subset selection techniques that are used in the dimensionality reduction.	10M
	OR	
13. B).	Describe K-Means algorithm with suitable example.	10M
14. A).	Explain about decision tree algorithm.	10M
	OR	
14. B).	Explain about Linear discrimination techniques that are used in the decision trees.	10M
15. A).	Discuss about learning Boolean functions of multilayer perceptron.	10M
	OR	
15. B).	Explain about bagging and boosting techniques that are used in the back propagation.	10M

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

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1.	Write briefly Time sharing systems.	2 M
2.	Define system calls.	2 M
3.	Differentite between Threads and Process.	2 M
4.	What is mean by PCB.	2 M
5.	Write briefly about Semaphores.	2 M
6.	What are the Dead Lock Prevention Policies?	2 M
7.	Write briefly about physical memory and virtual memory.	2 M
8.	What is mean by Address Translation?	2 M
9.	Write briefly about free space management.	2 M
10.	Write briefly about File Protection Techniques?	2 M

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

11.A).   i) Discuss in detail about evolution of Operating systems and its objectives?   5M
ii) Discuss about Operating system services.   5M

OR

11. B).   Discuss about Real Time systems, Operating system Hierarchy and Multi Programming concept.   10M

12. A).   Discuss in detail about various CPU scheduling Algorithms with examples.   10M

OR

12. B).   Discuss in detail about Inter Process Communication and also write about System call interface for process management   10M

13. A).   i) Write in detail on recovery from the Dead Locks.   5M
ii) Discuss about Banker's Algorithm for Dead lock prevention.   5M

OR

13. B).   i) Define Critical Section and Explain about Process Synchronization Techniques.   5M
ii) What are the conditions that create Dead Locks and Explain the same?   5M

14. A).   i) Write about Segmentation and Explain the Demand Paging and its Performance.   5M
ii) Differentiate between Logical and Physical Address Space with examples.   5M

(P.T.O..)

OR

14. B). i) What are the similarities of Paging and Framing and Explain the Structure of a page table. 5M

ii) Explain FIFO page Replacement Algorithm with neat Examples. 5M

15. A). i) Explain about Two-Level and Three Level Structured Directory. 5M

ii) Discuss about File sharing Methods? 5M

OR

15. B). i) Discuss about File system structure and Free Space management Techniques. 5M

ii) Discuss about File Protection Mechanisms. 5M

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

Date: 26.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define Schema and Instance.	2 M
2.	Explain various levels of data abstraction with their relationships.	2 M
3.	Write about the basic structure of SQL.	2 M
4.	Define Primary key and Candidate key.	2 M
5.	Define Domain Relational Calculus. Give the General Form.	2 M
6.	What is a normal form? Write its importance in database design.	2 M
7.	List out the transaction states.	2 M
8.	Define lock. List different types of locks used in concurrency control.	2 M
9.	Differentiate between ordered indices and hash indices.	2 M
10.	Describe the structure of a node in B+ tree.	2 M

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

11.A).	Define data model? Explain the different types of data models with examples?	10M
	OR	
11. B).	Draw an ER-diagram for a Bank database schema with at least five entity types. Also specify primary key and structural constraints?	10M
12. A).	What is data integrity? Explain the types of integrity constraints with suitable examples.	10M
	OR	
12. B).	What is a view? How to specify a view? Write about view implementation techniques.	10M
13. A).	Explain the role of functional dependencies in normalization with suitable examples.	10M
	OR	
13. B).	Explain about join and division operations in relational algebra.	10M
14. A).	Explain in detail about timestamp based concurrency control techniques.	10M
	OR	
14. B).	Draw transaction state diagram and describe each state that a transaction goes through during its execution?	10M
15. A).	Explain the various indexing schemes used in database environment.	10M
	OR	
15. B).	By considering relevant example, show insertion and deletion operations on a B+ Tree.	10M

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

Date: 22.07.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define the term Computer Architecture.	2 M
2.	Write down the operations of control unit?	2 M
3.	List the types of Character Data Representations.	2 M
4.	List types in ripple-carry adders.	2 M
5.	What is ALU.	2 M
6.	What is semiconductor memory?	2 M
7.	Define Pipeline processing.	2 M
8.	Define Write Through.	2 M
9.	Why do we use memory interleaving?	2 M
10.	List the types of pf cache memory mappings.	2 M

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

11.A).	Explain briefly addressing modes.	10M
	OR	
11. B).	Differentiate CISC and RISC.	10M
12. A).	Discuss the algorithm and flowchart of Booth's algorithm in detail	10M
	OR	
12. B).	Express 11 divide by 3 using Restoring Division Algorithm.	10M
13. A).	Write short notes on Microprogrammed Control Unit.	10M
	OR	
13. B).	Explain the role of interrupts in the process state transition.	10M
14. A).	Explain in detail Pipeline Hazards.	10M
	OR	
14. B).	Explain RISC pipeline with an example.	10M
15. A).	Discuss Hierarchical memory organization in detail.	10M
	OR	
15. B).	Write short notes on replacement algorithms.	10M

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

Course Name: Big Data Processing

(CSD)

Date: 24.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.   10x2=20M

1.	Write the importance of big data.	2 M
2.	List the four types of NoSQL databases.	2 M
3.	Write the history of Hadoop.	2 M
4.	Specify the role of name node and data node in HDFS	2 M
5.	Why Key Type need to be both Writable and Comparable in Map-Reduce Program?	2 M
6.	Give a note on Hadoop eco system.	2 M
7.	Difference between Hive and Hadoop.	2 M
8.	What is R and its features?	2 M
9.	What is data model in Cassandra?	2 M
10.	List the uses of CQL.	2 M

PART-B

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

11.A).	Explain the terminologies used in the big data environments.	10M
	OR	
11. B).	List and explain the big data applications.	10M
12. A).	Discuss the read data from HDFS.	10M
	OR	
12. B).	Explain the features of the Hadoop.	10M
13. A).	Discuss the map reduce and its architecture.	10M
	OR	
13. B).	List and explain the various operational modes of Hadoop cluster configuration	10M
14. A).	With neat sketch and explain about the configuration of CLI client and WI client while interacting with HIVE.	10M
	OR	
14. B).	Discuss the various data types supported by HIVEQL with an example.	10M
15. A).	List and explain the features Cassandra.	10M
	OR	
15. B).	Compare and contrast the row oriented vs column oriented data stores.	10M

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

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.	Write the differences between abstract class and interface.	2 M
2.	What is runtime polymorphism	2 M
3.	Write about finally clause in exception handling	2 M
4.	What is anonymous inner class	2 M
5.	What is the functionality of destroy (), isDaemon() methods	2 M
6.	Identify the class which allows an application to write primitive java data types to the output stream in a machine independent way	2 M
7.	Write about scanner	2 M
8.	Differentiate between statement and prepared statement	2 M
9.	Write about border layout	2 M
10.	List the ways to create frame in java swing	2 M

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

11.A).	What is multiple inheritance? Does java support multiple inheritance? Justify with suitable explanation.	10M
	OR	
11. B).	What is an Abstract Class? Write a program to illustrate abstract class	10M
12. A).	What is an Exception handling? List the benefits of exception and explain try, throw throws, catch, finally keywords.	10M
	OR	
12. B).	What is inner class? Write a program to demonstrate Inner classes	10M
13. A).	Explain in detail about the synchronization in java.	10M
	OR	
13. B).	Compare and Contrast between byte and character streams	10M
14. A).	What is JDBC? Explain in detail about Type-1 to Type-4 drivers	10M
	OR	
14. B).	Write a JDBC program to retrieve records from a table.	10M
15. A).	Explain delegation event model and write a program to handle mouse events.	10M
	OR	
15. B).	Describe applet life cycle in java and write a simple J-Applet program	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: Mathematics for Machine Learning
(Common for AID & AIM)

Date: 19.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1.	How to represent a Matrix in a Linear Equation?	2 M
2.	Define Group and Specify its properties.	2 M
3.	Write the formulae for Euclidean distance.	2 M
4.	How to represent an Orthogonal Matrix?	2 M
5.	Differentiate discrete and Continuous Probability.	2 M
6.	List the goals of learning.	2 M
7.	Why are we using RMSE method in Linear Regression?	2 M
8.	What is Dimensionality Reduction?	2 M
9.	Specify the purpose of EM Algorithm.	2 M
10.	Represent the Dual SVM: Convex Hull View.	2 M

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

11.A). Find the set S of all solutions in x of the following inhomogeneous linear systems Ax = b,   10M
where A and b are defined as follows.

$$A = \begin{bmatrix} 1 & -1 & 0 & 0 & 1 \\ 1 & 1 & 0 & -3 & 0 \\ 2 & -1 & 0 & 1 & -1 \\ -1 & 2 & 0 & -2 & -1 \end{bmatrix}, \quad b = \begin{bmatrix} 3 \\ 6 \\ 5 \\ -1 \end{bmatrix}$$

OR

11. B). Explain Rotations and inner product of functions.   10M

12. A). Show that for any $A \in R$ m×n the matrices $A^T A$ and AA^T possess the same nonzero   10M
eigenvalues.

OR

12. B). What are the useful Identities for computing gradients with examples.   10M

13. A). There are two bags. The first bag contains four mangos and two apples; the second bag   10M
contains four mangos and four apples.
We also have a biased coin, which shows "heads" with probability 0.6 and "tails" with
probability 0.4. If the coin shows "heads". We pick a fruit at random from bag 1;
otherwise we pick a fruit at random from bag 2.
Your friend flips the coin (you cannot see the result), picks a fruit at random from the
corresponding bag, and presents you a mango.
What is the probability that the mango was picked from bag 2?

(P.T.O..)

OR

13. B). Write a detail note on Learning and Empirical Risk Minimization. 10M

14. A). What is Linear Regression? How to specify the Bayesian linear Regression. 10M

OR

14. B). What is Dimensionality Reduction? Explain about PCA? 10M

15. A). Explain the Gaussian Mixture Model for Density Estimation. 10M

OR

15. B). What is Classification? Explain about Support Vector Machine. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: **Artificial Intelligence**
(Common for AID & AIM)

Date: 24.07.2024 AN　　　Time: 3 hours　　　Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.

10x2=20M

1.	Define Artificial Intelligence.	
2.	Recall the Turing test	2 M
3.	What is Heuristic Search?	2 M
4.	Compare Blind search and informed Search Strategies.	2 M
5.	State CSP.	2 M
6.	Define alpha-beta pruning.	2 M
7.	How is Knowledge represented?	2 M
8.	Define First order Logic	2 M
9.	List the two types of planning.	2 M
10.	State consistent plan.	2 M
		2 M

PART-B
Answer the following. Each question carries TEN Marks.

5x10=50M

11.A). Elaborate the foundations of Artificial Intelligence.

10M

OR

11. B). Illustrate in detail about the concept of intelligent agents.

10M

12. A). Discuss in detail about problem solving agents.

10M

OR

12. B). Explain the Hill Climbing method in detail with an example.

10M

13. A). Evaluate how to solve constraints satisfaction problem with backtracking search algorithm.

10M

OR

13. B). Evaluate how to achieve optimal decisions in games.

10M

14. A). Analyze the working model for First order logic.

10M

OR

14. B). Analyze the usage of knowledge-based agents in detail.

10M

15. A). Implement the method of representing knowledge in an uncertain domain.

10M

OR

15. B). Apply conditional planning in full and partial observable environment

10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Supplementary Examinations July/August-2024
Course Name: Python Programming
(Common for ME, ECE & IT)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1.	Define an identifier. List the rules to name an identifier.	2 M
2.	Write the use of pass statement in python.	2 M
3.	Define an exception.	2 M
4.	Write the difference between local variable and global variable.	2 M
5.	What is the purpose of zip( ) function?	2 M
6.	List sequence data types in Python.	2 M
7.	What is Instantiation in terms of OOP terminology?	2 M
8.	Differentiate between multi-level & multiple inheritance	2 M
9.	What is the use of config( ) function in tkinter Module?	2 M
10.	Which function is used to alter the thickness of the pen to 'x' units?	2 M

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

11.A).   Categorize Selection statements in python with suitable examples.   10M

OR

11. B).   Write an interactive program to read an integer. If it is positive then display the corresponding binary representation of that number. The user must enter 999 to stop. In case the user enters a negative number, then ignore that input and ask the user to re-enter any different number.   10M

12. A).   List out various random number functions in Python with examples.   10M

OR

12. B).   Define Exception and Demonstrate how to handle multiple exceptions in python with an example.   10M

13. A).   Discuss the Built-in Methods of Dictionary and Dictionary Comprehension with examples.   10M

OR

13. B).   Write a python script to accept a line of text and find the number of characters, number of vowels and number of blank spaces in it.   10M

14. A).   Discuss the various features of Object-Oriented Programming (OOP).   10M

(P.T.O..)

OR

14. B). Create 3 Classes with names 'Grandpa', 'Father' and 'Son'. Make the 'Father' Class as 10M
derived class for 'Grandpa' Class and 'Son' Class as derived class for 'Father' Class.
Initialize the 'Grandpa' Class with default constructor which holds 'Name of the Grandpa',
'Father' Class with default constructor which holds the 'Name of the Father', 'Son' Class
with default constructor which holds 'Name of the Son' and accessed the 'Name of the
Grandpa and Father' defined in above classes. Also, create a method dispfamname( )
method which prints 'Names of the Grandpa, Father and Son' when it is called with an
Object.

15. A). Discuss the Turtle module in Python for creating graphics and drawings. 10M

OR

15. B). Write a Python program using the Tkinter module to create a simple GUI application that 10M
incorporates label, button & frames widgets.

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

Course Name: Web Programming

(Common for ME, CSD & AID)

Date: 16.07.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. 10x2=20M

1.	Explain the structure of the HTML webpage with an example.	2 M
2.	Define image tag with an example.	2 M
3.	Write three different CSS properties related to text formatting.	2 M
4.	What is universal selector in CSS?	2 M
5.	What are data types supported by Java Script.	2 M
6.	Make use of JavaScript code snippet to know which mouse button was clicked.	2 M
7.	Explain about Internal DTD's.	2 M
8.	Compare and contrast between HTML and XML.	2 M
9.	Write a short note on DOM.	2 M
10.	What are the technologies used in AJAX?	2 M

PART-B

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

11.A). Design a simple form to register for new user including user_name, password, email, mobile number, gender and hobbies and illustrate the different form attributes. **10M**

OR

11. B). Create a timetable as shown below by using colspan and rowspan. **10M**

Time Table					
	Mon	Tue	Wed	Thu	Fri
	Math	Science	Math	Science	Arts
Hours	Math	Science	Math	Science	Arts
	Lunch				
	Math	Science	Math	Project	
	Math	Science	Math		

12. A). Illustrate the font-style, font-variant, font-weight properties of CSS. **10M**

OR

12. B). What is CSS? Explain the advantages and disadvantages of using CSS in XHTML? **10M**

13. A). Make use of JavaScript and find whether given number is prime or not. **10M**

OR

13. B). Examine the event in JavaScript and Give at least two examples of events with their handling. **10M**

(P.T..O..)

14. A).   Explain the procedure for validating the XML Documents.   10M

                                        OR

14. B).   Explain about various types of XML Parsers.   10M

15. A).   Compare traditional web applications with Ajax applications.   10M

                                        OR

15. B).   Distinguish between XML and DOM with an example.   10M

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

Course Name: Image Processing

(Common for CSC, CSD & AIM)

Date: 16.07.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. List out various components used in general purpose image processing system.   2 M
2. Explain Sampling and Quantization in brief.   2 M
3. List out various point processing techniques implemented in image processing.   2 M
4. Briefly Explain the basic steps for image filtering in frequency domain.   2 M
5. What is an order statistics filter? List the different statistics filters.   2 M
6. Explain the importance of image restoration process in image processing   2 M
7. Define Dilation and Erosion process.   2 M
8. Explain Region oriented segmentation.   2 M
9. List and define different redundancies.   2 M
10. Compare Lossless and Lossy compression.   2 M

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

11.A). With a neat block diagram, explain the fundamental steps in image processing   10M

OR

11. B). Define 2D DFT and derive four properties of 2D DFT.   10M

12. A). Perform histogram equalization for the following image data. Sketch the histogram of the original image and histogram of equalized image.   10M

r_k	0	1	2	3	4	5	6	7
n_k	790	1023	850	656	329	245	122	81

OR

12. B). Explain the smoothing of images in frequency domain using:
i) Ideal lowpass filter ii) Butterworth lowpass filter   10M

13. A). Explain in brief, the inverse filtering approach and its limitations.   10M

OR

13. B). Write a short note on Weiner filtering and inverse filtering.   10M

14. A). Discuss in detail the threshold selection based on boundary characteristics.   10M

OR

14. B). Explain the Dilation and Erosion operation in image morphology with examples.   10M

15. A). With neat diagram, explain image compression model.   10M

OR

15. B). Explain the schematics of image compression standard JPEG 2000 standard.   10M

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