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

Course Name: Strength of Materials-I

(Civil Engineering)

Date: 15.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

|		
1.	Define Poisson's ratio.	1 M
2.	A member of 3m length is heated from 20° C to 80°C. What is the expansion of member if coefficient of expansion is 12×10^{-6}.	1 M
3.	Define bending moment.	1 M
4.	What is the maximum bending moment in a simply supported beam of span 'L' subjected uniformly distributed load throughout of the span.	1 M
5.	Sketch the flexural stress and shear stress variation across the circular section.	1 M
6.	Define section modulus.	1 M
7.	State moment area theorem 1.	1 M
8.	What are the limitations of double integration method?	1 M
9.	Define principal stress.	1 M
10.	What is maximum principal stress theory?	1 M

PART-B

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

11.A). i) Sketch the stress- strain curve for mild steel and mark the salient features.   5M

ii) Determine the value of Young's modulus and Poisson's ratio of a metallic bar of length 300 mm, width 40mm and depth 40mm when the bar is subjected to an axial compressive load of 400 kN. The decrease in length is given as 0.75mm and increase in width is 0.03mm.   5M

OR

11. B). A mild steel rod of 20 mm diameter and 300 mm long is enclosed centrally inside a hollow copper tube of external diameter 30 mm and internal diameter of 25mm. the ends of the tube and rods are brazed together and the composite bar is subjected to an axial pull of 49 kN. If E for steel and copper is 200 GN/m² and 100 GN/m² respectively. Find the stresses developed in the rod and tube. Also find the extension of the rod.   10M

12. A). For the beam of 6 m shown in figure 1. Sketch Shear force and Bending moment diagrams. Find the magnitude and position of maximum bending moment.   10M
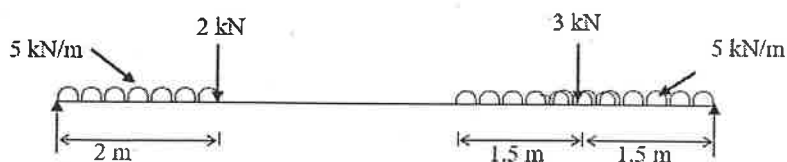
OR

12. B). i) Find the maximum bending moment in a simply supported beam subjected a uniformly distributed load (w/m) throughout the beam and draw shear force and bending moment diagrams.   5M

ii) Illustrate the derivation of the relationship between the intensity of loading, shear force and bending moment.   5M

13. A). A beam of I-section has top flange 125 mm × 16 mm, bottom flange 150 mm × 20 mm and web of thickness 12 mm. The total depth of the beam is 250 mm and simply supported over a span of 5 m. The beam is subjected to uniformly distributed load of 50 kN/m over its entire span in addition to a concentrated load 60 kN at its mid-span. Determine maximum bending stress and draw the bending stress distribution across the depth of the beam cross-section at a section located 3 m from the left support.   10M

OR

13. B). i) Derive the formula for shear stress at a section.   5M

ii) A cantilever beam of length 10 m has a cross section of 100 mm (width) × 150 mm (depth) has a UDL of 10KN/m over a length of 6 m from the fixed support and a concentrated load of 10 KN at the free end. Find the maximum shear stress at critical section of the beam.   5M

14. A). A simply supported beam of span 6m carries a UDL of 2kN/m over the full span and a concentrated load of 6kN at one third span from left support. Calculate the slope at supports and deflection at mid span. EI=3×10⁴ kNm².   10M

OR

14. B). i) State and explain Mohr's theorem I and II.   5M

ii) Determine the maximum slope and deflection in a cantilever of span 'L' subjected to uniformly distributed load 'w'/m throughout of the beam.   5M

15. A). A cylindrical shell made of mild steel plate and 1.2 m in diameter is to be subjected to an internal pressure of 1.5 MN/m². If the material yields at 200 MN/m², find the thickness of the plate on the basis of the following three theories. Assuming factor of safety 2 in each case. i) Maximum principal stress theory ii) Maximum shear stress theory iii) Maximum shear strain energy theory.   10M

OR

15. B). Derive an expression for the normal stress and shear stress on an oblique section of a strained body when it is subjected to direct stress in two mutually perpendicular directions and also accompanied by shear stress along the normal sections of the body.   10M

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

Date: 18.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

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

1.	Define the term Mineralogy.	1 M
2.	What is the importance of physical geology?	1 M
3.	What are the types of Minerals?	1 M
4.	What is metamorphic rock?	1 M
5.	Explain the mechanism of folding?	1 M
6.	What are the types of waters?	1 M
7.	What is the importance of radiometric method?	1 M
8.	What are the principles of Exploration Geo Physics?	1 M
9.	What are the Effects of Tunnels?	1 M
10.	What is Dam?	1 M

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

11.A). What is geology? Explain about main and allied branches of geology.   10M

OR

11. B). Explain effects and importance of weathering of rocks with reference to civil engineering.   10M

12. A). Describe the geological classification and give the characters of igneous rocks.   10M

OR

12. B). How sedimentary rocks are formed? Mention the important properties of sedimentary.   10M

13. A). How are folds classified? Describe different types of folds.   10M

OR

13. B). Classify and describe the different types of faults in rocks and explain how they are recognized in the field?   10M

14. A). Write the principle, parameters, methods and their applications of magnetic method.   10M

OR

14. B). Describe the importance of Electrical Resistivity studies in civil engineering.   10M

15. A). Explain over break of tunneling with reference to civil engineering.   10M

OR

15. B). Explain the influence of rock types for successful construction of dams.   10M

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

(Civil Engineering)

Date: 20.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1. Define Well-Conditioned and Ill-conditioned Triangles.   1 M
2. Convert the following whole circle bearings to quadrantal bearings: 1 M
   (a)$12° 45'$ (b) $160° 10'$
3. Write down the formulas for Curvature and refraction correction.   1 M
4. What is meant by Horizontal Equivalent?   1 M
5. Name and state the formulae for the computation of volume.   1 M
6. What is a mass diagram?   1 M
7. What are the different types of horizontal curves?   1 M
8. Define the terms 'point of curve' and 'point of tangency.   1 M
9. Abbreviation of GPS and GIS.   1 M
10. Define EDM. Give an example of an EDM Instrument.   1 M

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

11.A). Define briefly the concept of the Principle of Survey.   10M

OR

11. B). A line was measured with a steel tape which was exactly 30 metres at $20°$ C at a pull of 100 N (or 10 kgf), the measured length being 1650.00 metres. The temperature during measurement was $30°$C and the pull applied was 150 N (or 15 kgf). Find the length of the line, if the cross-sectional area of the tape was 0.025 sq. cm. The coefficient of expansion of the material of the tape per $1°$ C = $3.5 × 10^{-6}$ and the modulus of elasticity of the material of the tape = $2.1 × 10^5$ N/mm^2 ($2.1 × 10^6$ kg/cm^2).   10M

12. A). The following consecutive readings were taken with the help of a dumpy level: 1.905, 2.652, 3.245, 4.125, 1.854, 1.750, 1.550, 1.350, 1.815, 2.050, 3.145 and 1.725. The instrument was shifted after the fourth and seventh readings. The first reading was taken on the staff held on the BM of RL 100.00 metres. Rule out a page of level book. Enter the above readings there on. Calculate the RLs of the points and apply the arithmetical check.   10M

OR

12. B). Explain the characteristics of contours briefly.   10M

13. A). Explain the method of Reiteration by Theodolite survey?   10M

(P.T.O..)

13. B).   The formation level of a road is at a constant RL of 150.00 m. The ground levels along the   10M
centre line of the road are as follows:

Chainage (m)	0	40	80	120	160	200	240
Ground level (m)	152.60	151.90	149.00	150.90	151.50	152.45	151.20

Compute the volume of earthwork given that the formation width is 8 m and the side
slope 2:1.

14. A).   Tacheometer is set up at an intermediate point on a traverse leg AB and the following   10M
observations are made on a vertically held staff:

Staff station	Vertical angle	Staff readings
A	+ 5° 42'	1,756, 2.506, 3.256
B	3° 36'	0.855, 1.355, 1.655

The instrument is fitted with an anallatic lens and the multiplying constant is 100.
Compute the length AB and the reduced level of B if R.L. of A = 500.0 m.

14. B).   What are the types of curves? Explain the Elements of a simple curve.   10M

15. A).   Define the concept of Electronic wave theory and Applications of Total Station?   10M

15. B).   What are the components and Applications of GPS?   10M

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

(Civil Engineering)

Date: 23.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1.	Define Newton's law of viscosity.	1 M
2.	Define vapour pressure and surface tension of a fluid.	1 M
3.	Define rotational and irrotational flows.	1 M
4.	Write the Bernoulli's equation to real fluid flows.	1 M
5.	List the applications of momentum equations.	1 M
6.	Define the terms: notch and weir.	1 M
7.	List out various losses in pipe flow.	1 M
8.	Define Reynold's number and Froude's number.	1 M
9.	List the methods of controlling boundary layer.	1 M
10.	Write about displacement thickness and its expression.	1 M

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

11.A). Enumerate list of manometers and explain any two with neat sketch.   10M

OR

11. B). Calculate the dynamic viscosity of an oil, which is used for lubrication between a square plate of size 0.8 m x 0.8 m and an inclined plane with angle of inclination 30^0. The weight of the square plate is 300 N and it slides down the inclined plane with a uniform velocity of 0.3 m/s. The thickness of oil film is 1.5 mm.   10M

12. A). The velocity potential function is given by $\varphi = y^2 - x^2 - xy^{3/2} + x^{3y/2}$. Find the velocity components in x and y directions. Show that φ represents a possible case of flow.   10M

OR

12. B). Derive Bernoulli's Equation for a compressible frictionless fluid.   10M

13. A). A 45° reducing bend is connected in a pipe line, the diameters at the inlet and outlet of the bend being 600 mm and 300 mm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet to bend is 8.829 N/mm^2 and rate of flow of water is 600 lit/s.   10M

OR

13. B). Derive discharge equation for Triangular Notch.   10M

14. A). Describe briefly Reynolds experiment for characterization of flows in pipe.   10M

OR

14. B). Explain the concept of water hammer and its control measures.   10M

15. A). Discuss Characteristics of laminar and turbulent boundary layer.   10M

OR

15. B). How will you find the drag on a flat plate due to laminar and turbulent boundary layers?   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Basic Electrical and Electronics Engineering
(Common for CE & ME)

Date: 25.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

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

1. Draw sinusoidal voltage waveform and mark the frequency and time period.   1 M
2. State KCL.   1 M
3. Define Fuse.   1 M
4. What is the concept of balanced three phase circuits?   1 M
5. Draw the connection diagram of star-star type three phase transformers.   1 M
6. Write EMF equation of DC Generator?   1 M
7. Write applications are Zener diode.   1 M
8. Define ripple factor.   1 M
9. Name the terminals of FET.   1 M
10. Draw the connection diagram of BJT.   1 M

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

11.A). Write short notes on voltage and current sources.   10M

OR

11. B). Explain the voltage and current relations in star and delta connections.   10M

12. A). Write short notes on LT Switch gear and power factor improvement.   10M

OR

12. B). What are the types of Batteries and explain the important characteristics of Batteries.   10M

13. A). Explain the construction and working principle of DC Generator.   10M

OR

13. B). Analyze the construction and working principle of operation of three phase induction motor.   10M

14. A). Explain the principle of operation of Half wave rectifier and bridge rectifier.   10M

OR

14. B). Write short notes on harmonic components in rectifier circuits and Zener diode characteristics.   10M

15. A). Describe the CE, CB and CC configurations.   10M

OR

15. B). Compare BJT and FET and also discuss the Biasing FET.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Numerical Methods and Complex Variables
(Common for EEE & ECE)

Date: 15.07.2024 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 Regula-Falsi method formula.   1 M
2. Write Newton's forward difference interpolation formula.   1 M
3. Write Simpson's 3/8 th formula.   1 M
4. Write Modified Euler's method formula.   1 M
5. Define Analytic function.   1 M
6. Define conformal mapping.   1 M
7. State Cauchy's residue theorem.   1 M
8. Define pole of f(z).   1 M
9. State Dirichlet's conditions.   1 M
10. Write Fourier Cosine Integral.   1 M

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

11.A). Using Newton's iterative method, find the real roots of $x \log_{10} x = 1.2$ correct to five decimal places.   **10M**

OR

11. B). Find the polynomial $y(x)$ using Lagrange's Interpolation Formula and hence find $y(3)$ for the following data: **10M**

x	0	1	2	5
$y(x)$	2	3	12	147

12. A). Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using i) Trapezoidal rule, ii) Simpson's 1/3rd rule and iii) Simpson's 3/8th by taking step size h = 1.   **10M**

OR

12. B). Use Runge-Kutta Method of order 4 to compute y (0.2) and y (0.4).   **10M**
If $\frac{dy}{dx} = \frac{y^2-x^2}{y^2+x^2}$, given y (0) = 1

13. A). If $f(z)$ is analytic function of z, prove that $\left\{\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right\} |f(z)|^2 = 4|f'(z)|^2$ **10M**

OR

13. B). Determine the analytic function $f(z)$ whose real part is $x \sin x \cosh y - y \cos x \sinh y$.   **10M**

14. A). Evaluate $\oint_C \frac{e^z}{(z^2+\pi^2)^2} dz$, where C is $|z| = 4$.   **10M**

(P.T.O..)

OR

14. B). Evaluate $\oint_C \frac{e^z}{\cos \pi z} dz,$ *where C is the unit circle* $|z| = 1.$ 10M

15. A). Find the Fourier series to represent $f(x) = x - x^2$ *from* $x = -\pi$ *to* $\pi.$ 10M

OR

15. B). Find the Fourier Cosine Transform of $f(x) = e^{-x^2}.$ 10M

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

Date: 18.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1. What is the difference between steady state and transient response?   1 M
2. Write the initial conditions of L and C in a RLC series circuit.   1 M
3. What is the expression for voltage across inductor and voltage across capacitor in T- domain as well as S-domain.   1 M
4. Define the exponential function and draw the wave form?   1 M
5. Write the equations for Z and ABCD parameters.   1 M
6. Why ABCD parameters are used for representing Transmission line   1 M
7. Write the symmetry conditions for Y parameters.   1 M
8. Write the properties of Fourier transform.   1 M
9. Differentiate between Band Pass and Band Elimination filters   1 M
10. Draw the m-derived Low pass filter diagram   1 M

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

11.A). For a RL parallel circuit, a DC voltage is applied at t=0. Find the expression for Inductive and resistive current.   10M

OR

11. B). Determine the complete solution for the current when switch S is closed at t = 0. Applied voltage is   10M

$$v(t) = 50 \cos \left(10^2 t + \frac{\pi}{4} \right)$$

Resistance R = 10 Ω and capacitance C = 1 m F, for RC series circuit.

12. A). Derive an expression for current in an R-L series circuit when the circuit is excited with step voltage and impulse.   10M

OR

12. B). A series R-L circuit with R = 60 ohms and L = 30 H has a constant voltage V = 120 V applied t = 0. Determine the current, the voltage across resistor, and the inductor. Using Laplace transform approach.   10M

13. A). The Z parameters of a two-port network are Z11 = 10 Ω; Z22 =15 Ω; Z12 = Z21 = 5 Ω. Find the equivalent T network and ABCD parameters.   10M
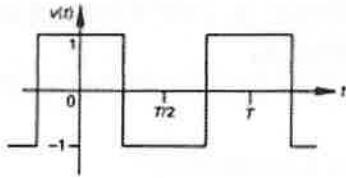
OR

13. B). Derive ABCD -parameters and h-parameters for a two port network explain in detail and derive interrelation between them.   10M

(P.T.O..)

14. A). Determine the Fourier series for the wave in figure. 10M

OR

14. B). Explain about continuous spectrum with an example. 10M

15. A). Design a m-derived High pass filter with neat diagram. 10M

OR

15. B). Design a band elimination filter having a design impedance of 600 Ω and cut-off 10M
frequencies $f_1 = 2$ kHz and $f_2 = 6$ kHz.

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

Date: 20.07.2024 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 ranges of coordinate variables of Cartesian coordinate system.	1 M
2.	List the types of three coordinate systems.	1 M
3.	Mention the applications of Gauss's law.	1 M
4.	Define Electric Field Intensity.	1 M
5.	What is the current density?	1 M
6.	Define Laplace equation.	1 M
7.	State point form of Ampere's law.	1 M
8.	Define magnetic force.	1 M
9.	State Motional EMF.	1 M
10.	Define displacement current.	1 M

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

11.A). Explain differential surface, differential length and differential volume in Cartesian coordinate system.   10M

OR

11. B). Discuss the conversion of coordinate from cartesian system to cylindrical system.   10M

12. A). State and explain Coulomb's law and Gauss's law.   10M

OR

12. B). Point charges 5nC and -2nC are located at (2, 0, 4) and (-3, 0, 5), respectively. Determine the force on a -1nC point charge located at (1,-3, 7). Find electric Field E at (1,-3, 7).   10M

13. A). Obtain boundary conditions between two dielectrics.   10M

OR

13. B). Determine whether or not the following potential fields satisfy the Laplace's equation. (a) $V = x^2 - y^2 + z^2$ (b) $V = \rho \cos \emptyset + z$ (c) $V = r \cos \theta + \emptyset$.   10M

14. A). State and Prove the Biot-Savart's law.   10M

OR

14. B). If a coil of 800µH is magnetically coupled to another coil of 200µH. The coefficient of coupling between two coils is 0.05 Calculate the equivalent inductance for the following connections. (i) Series aiding (ii) Series opposition (iii) Parallel aiding and (iv) Parallel opposing.   10M

15. A). Explain the Faraday laws of electromagnetic induction.   10M

OR

15. B). Explain the differential and integral form of Maxwell's equations for time varying fields.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Electrical Machines-I
(Electrical & Electronics Engineering)
Date: 23.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1.	What are the two unwanted effects of armature reaction?	1 M
2.	What type of DC generator is used for battery charging in auto mobiles?	1 M
3.	How will you change the direction of rotation of DC motor?	1 M
4.	Why starters are used for DC motors?	1 M
5.	List the advantages of Hopkinson's test?	1 M
6.	What is regenerative test?	1 M
7.	What is the function of a transformer?	1 M
8.	Define all day efficiency of a transformer?	1 M
9.	What is the purpose of performing short circuit test on a transformer?	1 M
10.	What is Sumpner's test?	1 M

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

11.A). Derive from first principles, an expression for the emf generated in the armature winding of a DC machine?   10M

OR

11. B). A 4-pole wave wound generator supplies a current of 50A. The shunt field takes 2A. There are 125 commutator segments. The brushes are given a load of 3 commutator segments. Calculate i) the demagnetizing ii) Cross magnetizing ampere-turns per pole.   10M

12. A). What are the applications of a DC shunt, series and compound motors?   10M

OR

12. B). Draw a neat sketch of a three-point starter for a DC shunt motor and explain.   10M

13. A). With a neat circuit diagram, describe the fields test for a series motor. Also give its disadvantages.   10M

OR

13. B). A 240V DC motor on brake test takes 52A when run at 1500 rpm. The spring balance at the end of the 75 cm brake arm reads 10 kg. determine the efficiency?   10M

14. A). From first principles, derive the emf equation of a transformer?   10M

OR

14. B). In a 50 KVA transformer, the iron loss is 400W and full load copper loss is 600W. Estimate its efficiency at i) Full load, upf and ii) half full load, 0.8 pf.   10M

15. A). Explain how the equivalent circuit parameters are determined from OC and SC test readings of transformer?   10M

OR

15. B). Explain the various types of three phase transformer connections.   10M

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

Date: 25.07.2024 AN	Time: 3 hours	Max.Marks: 60

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

1. What are the factors governing the selection of site for hydro power plant?   1 M
2. Write the advantages of gas power plant.   1 M
3. What is skin effect?   1 M
4. Write the types of insulators.   1 M
5. Compare DC and AC distribution.   1 M
6. Explain classification of Distribution systems.   1 M
7. Name the various components present in a substation.   1 M
8. How does a.c distribution differ form d.c distribution?   1 M
9. What are the causes for low power factor?   1 M
10. What is maximum demand?   1 M

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

11.A). Explain the function of the following in thermal power plant and explain the principle of   10M
operation of each:
    i. Economizer
    ii. Electrostatic precipitator
    iii. Condenser
    iv. Super heater
    v. Cooling tower

OR

11. B). i) What are the different merits and demerits of hydro power plant.   5M
ii) Enumerate & explain essential components of hydro power plant.   5M

12. A). i) Derive the expression for the capacitance of a two wire system.   5M
ii) What is the need for transposition? And explain the concept of GMR and GMD.   5M

OR

12. B). Write short notes on different types of insulators used for overhead lines and their   10M
application.

13. A). Derive the expression for voltage drop for radial distribution fed at both ends with   10M
unequal voltages.

OR

13. B). Enumerate the advantages of over head compared to underground distribution systems.   10M

(P.T.O..)

14. A). i) Explain the method of voltage drop calculations in A,C distributor. 5M

ii) Draw the phasor diagrams of A.C. distributor with concentrated loads for power factors 5M
with respect to respective load points.

OR

14. B). What is a substation. Name the factors that should be taken care of while designing and 10M
erecting substation.

15. A). i) What are load curves and load duration curves? Discuss their utility in the economics of 5M
generation.

ii) A generating station has a connected load of 43MW and a maximum demand of 5M
20MW; the units generated being 61.5×10^6 per annum. Calculate
    a). The demand factor
    b). Load factor

OR

15. B). What are the main objectives in framing a tariff? Discuss various types of tariffs. 10M

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

Course Name: Digital Electronics

(Common for CSE, CSC & IT)

Date: 18.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

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

1. Find the 1's and 2's complement of $(10000)_2$ 1 M
2. Implement AND gate using only NOR gates.   1 M
3. Define quad in K-Maps.   1 M
4. Define Standard SOP.   1 M
5. Define a combinational logic circuit and give some examples.   1 M
6. Implement a 4×1 mux using 2×1 mux's.   1 M
7. Write the characteristic table of JK Flip flop.   1 M
8. Define state diagram.   1 M
9. Differentiate between RAM and ROM.   1 M
10. What are Hazards? List their types?   1 M

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

11.A). Convert the following to Binary and then to gray code: 10M
     i) $(AB33)_{16}$ ii) $(3323)_8$

OR

11. B). i) Convert the given expression in standard SOP form   5M
     $F(A, B, C) = A\bar{B} + A\bar{C} + BC$

     ii) Convert the given expression in standard POS form   5M
     $F(A, B, C, D) = (A + \bar{B})(A + \bar{B} + D)$

12. A). Simplify F(A,B,C,D) = $\sum$ (4,5,6,7,12,13,14) +d(1,9,11,15) using K-map and implement it using NAND gates only.   10M

OR

12. B). Simplify the following Boolean function using K-map   10M
     F(A,B,C,D) = πM (1,5,6,7,11,12,13,15) and implement it using NOR gates only.

13. A). Construct a full adder using only two half adders and one OR gate and explain with the truth table.   10M

OR

13. B). Explain the operation of 3 to 8 line decoder with the help of a truth table and realize 4×16 decoder by using 2×4 decoders.   10M

(P.T.O..)

14. A). With a neat diagram, explain the operation of types of shift register. 10M

OR

14. B). Design a mod-10 Ripple counter using T flip flops and explain its operation. 10M

15. A). What are PLAs? Explain the working of a PLA with a schematic and implement the 10M
following two Boolean functions with a PLA:
F1 (A, B, C) = $\sum$ (0, 1, 2, 4) and F2 (A,B,C)= $\sum$(0, 5, 6, 7)

OR

15. B). Write about Hazards in sequential circuits. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Electronics Devices and Circuits
(Common for CSE, IT, CSC, CSM, CSD & AID)

Date: 20.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1. Define transition capacitance.   1 M
2. Draw the characteristics curve for LED.   1 M
3. What are the requirements for biasing circuits?   1 M
4. What is meant by negative resistance region of UJT?   1 M
5. Draw the small signal equivalent circuit of CE amplifier.   1 M
6. Why NPN transistor has a better high frequency response than the PNP transistor? 1 M
7. Mention the need for a coupling capacitor in amplifier circuits. 1 M
8. Define Pinch-off voltage.   1 M
9. Define Principles of Tunnel diode.   1 M
10. Draw the V-I characteristics of varactor diode.   1 M

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

11.A). Explain the characteristics of PN junction diode under forward Biased condition.   10M

OR

11. B). Draw and explain the graph indicating the variation of minority carrier density with distance in a p-n junction diode under forward biased condition.   10M

12. A). Draw and explain the circuit of a half-wave rectifier with capacitor filter.   10M

OR

12. B). Explain the working of full wave rectifier and derive the necessary equations to calculate the efficiency.   10M

13. A). Derive the necessary equation to calculate the gain, input and output impedance of common emitter amplifier.   10M

OR

13. B). Draw the small signal equivalent model for Common collector amplifier constructed using BJT and derive the expression for current gain, voltage gain, input resistance and output resistance.   10M

14. A). Find the mid band gain am and the upper 3db frequency fH of a cs (common source) amplifier fed with a signal source having an internal resistance Rsig = 100 KΩ. The amplifier has Rg 4.7 mΩ, RD = Rl = 15 KΩ, gm = 1 ma/v, ro = 150 KΩ, cgs = 1 pF, cgd = 0.4 pF.   10M

OR

14. B). Draw and explain the construction and principle of JFET in detail.   10M

15. A). Explain the working of Zener diode as Regulator.   10M

OR

15. B). Explain the structure and working of UJT with relevant diagrams.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Object Oriented Programming through Java
(Common for CSE, CSC & CSD)

Date: 23.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

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

1.	Define Type conversion.	1 M
2.	What is the use of public keyword?	1 M
3.	Define class.	1 M
4.	Define an interface.	1 M
5.	What is meant by Exception handling?	1 M
6.	What is the purpose of thread priority?	1 M
7.	What is meant by canvas?	1 M
8.	Abbreviation of MVC.	1 M
9.	List any two event listeners.	1 M
10.	Define Servlet.	1 M

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

11.A).	i) Write a java program to implement method overloading.	5M
	ii) Explain history of java.	5M

OR

11. B).	How "this" reference can be used to access class fields in java? Demonstrate with sample java program.	10M

12. A).	List out forms of inheritances. Explain any two forms with an example program.	10M

OR

12. B).	i) How to create, import and use a java package? Demonstrate with a sample program.	5M
	ii) Explain interface with an example program.	5M

13. A).	With the help of a sample java program demonstrate how run time errors(exceptions) can be handled in a java program to avoid abrupt termination of applications.	10M

OR

13. B).	Explain the two different methods for creating a Thread with an example for each?	10M
14. A).	Explain AWT(GUI) controls with example:	10M
	i) Label	
	ii) Button	
	iii) Checkbox	

OR

14. B).	Differentiate AWT with Swing? Can we use the same layout managers with both AWT and Swing applications? Justify your answer.	10M
15. A).	Implement a java program using listeners for handling mouse events.	10M

OR

15. B).	Explain JDBC concept with an example program.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Computer Oriented Statistical Methods
(Common for IT & CSD)

Date: 15.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1. List the elements of each of the following sample spaces: 1 M
   (a) the set of integers between 1 and 50 divisible by 8;
   (b) the set S = {x | $x^2 + 4x - 5 = 0$};
2. Define Random Variable.   1 M
3. Calculate the mean and standard deviation of a probability distribution. 1 M
4. Specify the formulae for Poisson Distribution?   1 M
5. Determine the mean and standard deviation of the sampling distribution of the sample mean   1 M
   when you plan to take an SRS of size 64 from a population with mean 44 and standard
   deviation 16.
6. Define point and interval estimations with example.   1 M
7. How to estimate the ratio of two variances?   1 M
8. Determine the Statistical hypotheses.   1 M
9. What are n-step transition probabilities?   1 M
10. Define the term Transition Probability.   1 M

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

11.A). i) If F(x) is the distribution function of x is given $F(X) = 0$ if $x \leq 1$, $k(x - 1)$ if $1 < x \leq 3$,   5M
        0 if $x > 3$ Determine a) f(x)   b) k iii)mean

       ii) Average number of accidents on any day on a national highway is 1.8 Determine the   5M
       probability that the number of accidents are
       a) atleast one   b) atmost one   c)) exactly one

OR

11. B). Determine the values of c so that the following functions represent joint probability   10M
        distributions of the random variables X and Y :
        i) f(x, y) = cxy, for x = 1, 2, 3; y = 1, 2, 3;
        ii) f(x, y) = c|x − y|, for x = −2, 0, 2; y = −2, 3.

12. A). i) Determine the term Variance and Covariance of a Random variable with suitable   5M
        example.
        ii) Out of 800 families with 5 children each has may would you expect to have
            i)   3 boys   5M
            ii)   At least one boy
            iii)   Either 2 or 3 boys.

(P.T.O..)

OR

12. B).	i) Explain in detail about the term Binomial Distribution.	5M
	ii) There are four fused bulbs in a lot of 10 good bulbs. If three bulbs are drawn at random with replacement, find the probability of distribution of the number of fused bulbs drawn.	5M
13. A).	What are the applications of Normal Distribution? With sample examples.	10M

OR

13. B).	Explain about the Sampling Distribution of Means and the Central Limit Theorem.	10M
14. A).	i) Explain in detail about Classical Estimation Model.	5M
	ii) A sample had the following values 45,47,50,52,48,47,49,53, and 51. Does the mean of nine items differ significantly from the population mean of 47.5 at 5% level.	5M

OR

14. B).	Distinguish the major differences in one sample tests and two sample tests with suitable examples.	10M
15. A).	Explain about the Transition Probability Matrix with suitable example.	10M

OR

15. B).	Explain about the Transition matrices for Markov Chain. Use the transition matrix and the initial state vector to find the state vector that gives the distribution after a specified number of transitions.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: **Computer Organization and Microprocessor**
(Information Technology)

Date: 23.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1. Why the importance of Computer Organization?   1 M
2. Identify the need of Registers.   1 M
3. Discuss about 8086 processor.   1 M
4. Construct the Features of minimum and maximum mode system.   1 M
5. Explain about machine coding.   1 M
6. Write a Short notes on Interrupts.   1 M
7. Summarize about Priority Interrupt.   1 M
8. Discuss about Peripheral Devices.   1 M
9. What are Auxiliary memories?   1 M
10. How can usage of Array processor increase performance?   1 M

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

11.A). i) Outline about Block Diagram of Digital Computer.   5M
       ii) Identify the need of Computer Registers.   5M

OR

11. B). i) Interpret the Timing and Control.   5M
        ii) Analyze the Instruction Cycle in detail.   5M

12. A). Identify the 8086 Processor Architecture.   10M

OR

12. B). Elaborate about Physical Memory organization and general bus operations.   10M

13. A). i) Explain about timings and delays.   5M
        ii) Outline about Assembly language programs with an example.   5M

OR

13. B). i) Construct stack structure of 8086.   5M
        ii) Summarize about on Interrupt cycle of 8086.   5M

14. A). Illustrate in detail about the Asynchronous Data Transfer and Modes of Transfer.   10M

OR

14. B). Elaborate about all the computer arithmetic operation algorithms.   10M

15. A). Summarize about Associate memory & Main memory.   10M

OR

15. B). Determine in detail about the processing of RISC Pipeline & Instruction.   10M

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H.T No: ☐☐☐☐☐☐☐☐☐☐   **R22**   Course Code: A412302

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

Course Name: Introduction to IOT

(Information Technology)

Date: 25.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

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

1. Why do IoT Systems have to be Self-adapting and self-configuring?   1 M
2. What are smart objects? Give some examples.   1 M
3. Define SDN.   1 M
4. Which communication protocols are used for M2M local area networks?   1 M
5. What is the difference between a physical and virtual entity?   1 M
6. In which scenario SNMP is not suitable for IoT.   1 M
7. Write about Raspberry Pi.   1 M
8. What is use of GPIO pins?   1 M
9. Write the RPC model client roles.   1 M
10. Write a short notes on Template in Django Architecture.   1 M

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

11.A). Classify network types based on physical topologies and connection types with schematic diagrams.   10M

OR

11. B). Explain WebSocket-based Communication APIs in IoT.   10M
12. A). Explain the benefits of an IoT oriented approach over M2M by considering a Health band as the real world use case example. Compare the main characteristics of M2M and IoT   10M

OR

12. B). Explain an information driven value chain for IoT with a neat diagram   10M
13. A). What is the importance and purpose of Requirements specification in IoT Design Methodology?   10M

OR

13. B). How is function overriding implemented in python? Explain critical scenario in IoT.   10M
14. A). Explain Raspberry Pi GPIO headers with neat diagram.   10M

OR

14. B). Write a Python program for controlling an LED with a switch with importing GPIO package.   10M
15. A). What are the uses of messaging queues? What are the message formats supported by Amazon SQS?   10M

OR

15. B). Write the steps to create a new Django project and App.   10M

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

(CSC)

Date: 15.07.2024 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. State law of contrapositive.   1 M
2. Write the dual of ~(p ∨ q)∧[p ∨ ~(q ∧~r)]   1 M
3. If R is a symmetric relation, then show that $R \cup R^{-1} = R$ 1 M
4. If A = {α, β}, B = {1, 2, 3}. Find out (A x B) U (B x A).   1 M
5. Check whether $G = \{1,2,3,...,*\}$ is a group or not   1 M
6. Give an example of a semi-group.   1 M
7. Find the number of arrangements of the letters of the word "ALLAHABAD"   1 M
8. Write the Principles of Inclusion and Exclusion.   1 M
9. Is K₂,₃ planar graph?   1 M
10. Define chromatic number.   1 M

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

11.A). Construct the truth table for the logical relation $\{[p \rightarrow (q \lor r)] \land (\sim q)\} \rightarrow (p \rightarrow r)$ 10M

OR

11. B). i) Prove or disprove the validity of the following argument   5M
Some dogs are animals
Some cats are animals
Therefore some dogs are cats.

ii) Check whether the propositional function $[(p \rightarrow r) \land (q \rightarrow r)] \rightarrow [(p \lor q) \rightarrow r]$ is a tautology or not ?   5M

12. A). i) Let X = {1, 2, 3, 4} and a mapping f : X→X be given by f={(1, 2), (2, 3), (3, 4), (4, 1)}. Find the composition function f², f³ and f⁴ .   5M

ii) Draw the Hasse diagram for the partial ordering {(A, B) |A ⊆B} on the power set P(S), where S = {a, b, c}.   5M

OR

12. B). Let $A = \{1,2,3,4\}$ and $R = \{(1,1),(1,2),(2,1),(2,2),(3,4),(4,3),(3,3),(4,4)\}$ be a relation on A Verify that R is an equivalence relation.   10M

13. A). i) Let G = {-1, 0, 1}, verify whether G forms a group under usual addition.   5M

ii) Prove that (S, ≤) is a Lattice, where S= {1, 2, 5, 10} and ≤ is for divisibility. Prove that it is also a Distributive Lattice?   5M

(P.T.O..)

13. B). In any group (G, *) , by proving the inverse of every element is unique. Show that $(a * b)^{-1}$ 10M
$= b^{-1} a^{-1}$, $\forall$ a, b $\in$ G.

14. A). i) In a survey it was found that 21 people liked product A, 26 liked the product B, 29 liked   5M
product C. If 14 liked product A and B, 12 liked product A and C,14 liked product B and
C. Find how many liked only B?

ii) What is the coefficient of the term $x^8 y^{12}$ and $x^{10} y^{10}$ in the expansion of $(3x + 4y)^{20}$?   5M

OR

14. B). i) Find the number of positive integers from 1 to 500 which are divisible by at least one of   5M
3, 5, and 7.

ii) Determine the coefficient of $a^3 b^2 c^2 d^3$ in the expansion of $(a+3b-4c+2d)^{10}$.   5M

15. A). i) Define spanning tree of a graph and explain DFS algorithm to find spanning tree of a   5M
graph with suitable example.

ii) Determine whether the following graphs are isomorphic.   5M

G   H
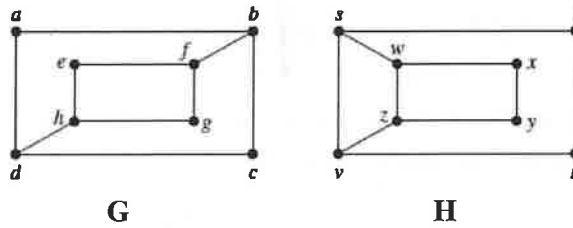
OR

15. B). i) What is Hamiltonian circuit? Check whether the following graph has Hamiltonian   5M
circuit or not.
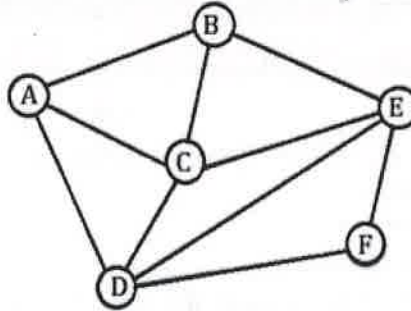
ii) If G is a connected planar graph, then prove that $|V| - |E| + |R| = 2$.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Database Management Systems
(Common for CSE, CSC & CSD)

Date: 25.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1.	List any five applications of DBMS.	1 M
2.	Define weak entity. Show with example.	1 M
3.	Give the function of Referential integrity constraint.	1 M
4.	What is the difference between Tuple Relational Calculus and Domain Relational Calculus?	1 M
5.	What are aggregate functions? List the aggregate functions supported by SQL.	1 M
6.	What are the conditions required for a relation to be in 1NF and 2NF?	1 M
7.	Give the states of transaction.	1 M
8.	List the phases of Two-Phase Locking Protocol?	1 M
9.	Differentiate B Tree and B+ Tree index.	1 M
10.	Differentiate static hashing and dynamic hashing.	1 M

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

11.A). Define Database? Explain the structure of Database Management Systems with a neat sketch.   10M

OR

11. B). What is Entity-Relationship model? Distinguish the different types of attributes used in E-R diagram with suitable examples.   10M

12. A). Explain the following terms with suitable examples.   10M
i) Primary Key   ii) Candidate Key   iii) Super key   iv) Foreign Key

OR

12. B). Discuss the fundamental operations in relational algebra with examples.   10M

13. A). We have following relations: 10M
        Supplier (S#, sname, status, city)
        Parts (P#, pname, color, weight, city)
        SP (S#, P#, quantity)
    Answer the following queries in SQL:
      i. Find name of supplier for city = 'Delhi'.
      ii. Find suppliers whose name start with 'AB'
     iii. Find all suppliers whose status is 10, 20 or 30.
     iv. Find total number of city of all suppliers.
     v. Find s# of supplier who supplies 'red' part.

OR

13. B). What is the advantage of using 3NF? Explain with Example.   10M

(P.T.O..)

14. A). Discuss in detail the important properties of transaction?   10M

OR

14. B). Explain the time stamp-based concurrency control protocol. How is it used to ensure serializability?   10M

15. A). What is indexing? Describe different types of Indexing in DBMS briefly?   10M

OR

15. B). Give a comparison of various file organizations.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Computer Organization and Architecture
(Common for CSM, CSD, AIM & AID)

Date: 18.07.2024 AN	Time: 3 hours	Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1.	List out the basic components of computer system.	1 M
2.	Define instruction codes.	1 M
3.	Give example for micro program.	1 M
4.	List common types of addressing modes.	1 M
5.	Write IEEE standard for floating point format.	1 M
6.	Define booth's algorithm.	1 M
7.	What is priority interrupt?	1 M
8.	State cache memory.	1 M
9.	List out some RISC characteristics.	1 M
10.	Define array processor.	1 M

PART-B

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

11.A).	Explain the components of digital computer with block diagram.	10M
	OR	
11. B).	i) Write short notes on register transfer language.	5M
	ii) Briefly discuss about memory reference instructions.	5M
12. A).	Analyze different design types of control unit with its merits and demerits.	10M
	OR	
12. B).	Examine different types of instructions with examples. Compare their relative merits and demerits.	10M
13. A).	Derive and explain an algorithm for adding and subtracting two floating point binary numbers.	10M
	OR	
13. B).	Develop booth's algorithm for multiplication of signed two's complement numbers.	10M
14. A).	Explain in detail about the concept of direct memory access.	10M
	OR	
14. B).	i) Briefly discuss auxiliary memory.	5M
	ii) Write short notes on memory hierarchy.	5M
15. A).	i) Compare RISC and CISC Instruction.	5M
	ii) Analyze the usage of pipeline processing.	5M
	OR	
15. B).	Explain in details bout the concept of arithmetic pipeline.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Mathematical and Statistical Foundations
(Common for CSM & AIM)

Date: 23.07.2024 AN   Time: 3 hours   Max.Marks: 60

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

1. Find whether integers 24,42 are relatively prime.   1 M
2. What is the value of $28 \cong 9 (\text{mod } 7).$?   1 M
3. Define regression.   1 M
4. Define Binomial distribution.   1 M
5. Show the normal curve for $P(X > x_1)$ if $z_1 > 0$.   1 M
6. What is the statistical formula for t – distribution?   1 M
7. What is formula for z for single means?   1 M
8. What is confidence interval?   1 M
9. Define stochastic process.   1 M
10. When do you say Markov chain is irreducible?   1 M

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

11.A). i) Make use of Euclidean algorithm, to find greatest common divisor for 666 to 1414.   5M
  ii) Find the least positive residue of 3^{10} modulo 11.   5M

OR

11. B). i) Find all the solutions for 20x + 50y = 510.   5M
  ii) Find all solutions of system of linear congruence   5M
  $x + 2y \equiv 1(\text{mod } 5)\, and\, 2x + y \equiv 1(\text{mod } 5).$

12. A). The following is a portion of a classic data set called the "pilot plot data" in *Fitting Equations to Data* by Daniel and Wood, published in 1971. The response *y* is the acid content of material produced by   10M
  titration, whereas the regressor *x* is the organic acid content produced by extraction and weighing.

x	123	55	100	75	159	109	48	138	64
y	76	62	66	58	88	70	37	82	88

  (a) Plot the data; does it appear that a simple linear regression will be a suitable model?
  (b) Fit a simple linear regression; estimate a slope and intercept.
  (c) Graph the regression line on the plot in (a).

OR

12. B). Assume that 50% of all engineering students are good in Mathematics. Determine the probabilities that among 18 engineering students (i) exactly 10 (ii) at least 10.   10M

(P.T.O..)

13. A). 1000 students have written an examination, the mean of the test is 40 and standard deviation is 10. Find   10M

(i) How many students have the marks lie between 30 and 50?

(ii) How many students will get more than 50 marks?

(iii)How many students will get below 35 marks?

(iv) How many students will get above 60 marks?

OR

13. B). If the population is 4, 8, 12, 16 and 20, then consider all possible samples of size two which can be drawn with replacement from this population. Then find (i) The mean of the population (ii) standard deviation of the population (iii)the sampling distribution of means (iv) mean of the sampling distribution of means   10M

14. A). A random sample of 100 automobile owners in the state of Virginia shows that an automobile is driven on average 23,500 kilometers per year with a standard deviation of 3900 kilometers. Assume the distribution of measurements to be approximately normal.   10M

(i) Construct a 99% confidence interval for the average number of kilometers an automobile is driven annually in Virginia.

(ii) What can we assert with 99% confidence about the possible size of our error if we estimate the average number of kilometers driven by car owners in Virginia to be 23,500 kilometers per year?

OR

14. B). A study was conducted by the Department of Zoology at the Virginia Tech to estimate the difference in the amounts of the chemical orthophosphorus measured at two different stations on the James River. Orthophosphorus was measured in milligrams per liter. Fifteen samples were collected from station 1, and 12 samples were obtained from station 2. The 15 samples from station 1 had an average orthophosphorus content of 3.84 milligrams per liter and a standard deviation of 3.07 milligrams per liter, while the 12 samples from station 2 had an average content of 1.49 milligrams per liter and a standard deviation of 0.80 milligram per liter. Find a 95% confidence interval for the difference in the true average orthophosphorus contents at these two stations, assuming that the observations came from normal populations with different variances.   10M

15. A). Consider a markov process with state space s = {0, 1, 2} and transition matrix   10M

$$P = \begin{bmatrix} p & q & 0 \\ 1/2 & 0 & 1/2 \\ p-1/2 & 7/10 & 1/5 \end{bmatrix}$$

Find (i) What can you say about the values of p and q?

(ii) Calculate the transition probabilities $P_{ij}^{(3)}$.

(iii) Draw the transition graph for the process represented by P.

OR

15. B). Classify the states of the Markov chains with the following transition probabilities: 10M

$$\text{i) } P = \begin{pmatrix} 1/2 & 0 & 0 \\ 0 & 1/2 & 0 \\ 0 & 0 & 1/2 \end{pmatrix} \qquad \text{ii) } P = \begin{pmatrix} 1/2 & 0 & 1/3 & 2/3 \\ 1 & 1/2 & 0 & 0 \\ 1/3 & 1/3 & 1/2 & 0 \\ 0 & 0 & 1 & 1/2 \end{pmatrix}$$

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

Date: 25.07.2024 AN	Time: 3 hours	Max.Marks: 60

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

1. What is an Operating System?   1 M
2. Define Thread.   1 M
3. List different CPU scheduling algorithms.   1 M
4. Define Deadlock.   1 M
5. Define semaphores.   1 M
6. What is the purpose of shared memory in IPC?   1 M
7. Define Swapping.   1 M
8. List out the Page Replacement algorithms.   1 M
9. What are the different file access methods?   1 M
10. Define the ioctl system call.   1 M

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

11.A). Compare and contrast time-shared and real-time operating systems.   10M

OR

11. B). Discuss the concept of a process in an operating system and outline the typical states of a process lifecycle.   10M

12. A). Explain the functions of important process management system calls such as fork(), exit(), wait(), waitpid(), and exec().   10M

OR

12. B). Explain Banker's algorithm for deadlock avoidance with an example.   10M

13. A). Describe how synchronization hardware can be used to manage concurrent process execution.   10M

OR

13. B). Define semaphore. Explain the method of application of semaphore for process synchronization.   10M

14. A). Discuss the advantages and disadvantages of using logical address space instead of physical address space.   10M

OR

14. B). Explain any two Page replacement algorithms with examples.   10M

15. A). Explain the importance of file protection mechanisms.   10M

OR

15. B). Explain the following: 10M
    i) open   ii) create   iii) read   iv) write

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Building Materials, Construction and Planning
(Civil Engineering)

Date: 27.07.2024 AN

Time: 3 hours

Max.Marks: 60

(Note: Assume suitable data if necessary)

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

10x1=10M

1.	What do you mean by dressing of a stone?	1 M
2.	What is the composition of fly ash?	1 M
3.	What is the chemical composition of OPC?	1 M
4.	What are the advantages of admixtures?	1 M
5.	What are the uses of a lintel?	1 M
6.	What is the need of acoustics in building design?	1 M
7.	List the different types of stone masonry.	1 M
8.	What is pointing?	1 M
9.	Define a green building.	1 M
10.	Why orientation of a building is important?	1 M

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

5x10=50M

11.A). Explain the process of quarrying by blasting techniques with a neat sketch. 10M

OR

11. B). Explain the manufacturing process of bricks. 10M

12. A). Explain the following tests in detail: Consistency, Initial and Final Setting time of Cement. 10M

OR

12. B). Explain the manufacturing process of cement using dry process with a flow diagram. 10M

13. A). Explain the classification of arches with neat sketches. 10M

OR

13. B). What are the functional requirements of ventilation? Explain Natural and Mechanical ventilation in detail. 10M

14. A). Define Ponting and explain different types of pointing in detail. 10M

OR

14. B). Define Scaffolding and discuss various types of scaffolding. 10M

15. A). Appraise the various practical points to be considered while planning a building. 10M

OR

15. B). Classify different types of buildings in detail. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Basic Electronic Circuits
(ECE)

Date: 27.07.2024 AN   Time: 3 hours   Max.Marks: 60

(Note: Assume suitable data if necessary)

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

10x1=10M

1. Draw the equivalent circuit of a diode.
2. Define transmission capacitance in a diode.   1 M
3. How does a half-wave rectifier differ from a full-wave rectifier?   1 M
4. Draw the circuit diagram of a negative clamper.   1 M
5. Relate collector current and base current in an ideal BJT.   1 M
6. Interpret the term Q-point in BJT biasing.   1 M
7. Why is FET considered a voltage-controlled device?   1 M
8. What is the main principle of operation of a FET?   1 M
9. Compare avalanche breakdown and Zener breakdown?   1 M
10. Draw the symbol of UJT and indicate terminals.   1 M
          1 M

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

5x10=50M

11.A). Derive the expression for the diode current equation.   10M

OR

11. B). The reverse saturation current passing through the reverse biased PN-Junction diode is $I_0=2\mu A$. If the temperature rises by 10^0C, calculate the corresponding I_0.   10M

12. A). With the help of neat circuit diagram explain the operation of bridge rectifier.   10M

OR

12. B). Compare and contrast series and shunt clipper circuits. Provide circuit diagrams for both types and explain how each type clips the input signal.   10M

13. A). Illustrate the operation of CE Configuration of BJT and its input and output characteristics briefly.   10M

OR

13. B). Draw the diode based compensation circuit and discuss for its stability.   10M

14. A). Illustrate the operation of JFET. Draw its drain and transfer characteristics.   10M

OR

14. B). Draw the construction diagram, operation characteristics and parameters of MOSFET.   10M

15. A). Differentiate between zener breakdown and avalanche breakdown.   10M

OR

15. B). Interpret the principle of operation of SCR & its characteristics.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations July/August-2024
Course Name: Basic Electrical Engineering
(Computer Science & Engineering)

Date: 27.07.2024 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.	State thevenin's theorem.	1 M
2.	Define an ideal voltage source.	1 M
3.	Define the form factor.	1 M
4.	Write the formula of power factor.	1 M
5.	What is the function of a Transformer?	1 M
6.	Define voltage regulation of a transformer.	1 M
7.	State the basic parts of a DC machine.	1 M
8.	What is meant by slip of an Induction motor?	1 M
9.	What is meant by MCB?	1 M
10.	What are the types of batteries?	1 M

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

11.A).	State and explain the Super position theorem with suitable example.	10M
	OR	
11. B).	Explain the following: i) Types of circuit elements ii) Time response of first order RL series circuit.	10M
12. A).	Explain the following terms: i) Real power ii) Reactive power iii) Apparent power iv) Peak values v) RMS values.	10M
	OR	
12. B).	Find the Form factor and Peak factor of a sinusoidal current waveform.	10M
13. A).	Discuss the three phase transformer connections with neat sketch.	10M
	OR	
13. B).	i) Enumerate various losses in a transformer?	5M
	ii) Explain the Auto transformer working principle with neat sketch.	5M
14. A).	Describe with sketches the construction of a DC machine.	10M
	OR	
14. B).	Explain the construction and working principle of a synchronous generator.	10M
15. A).	What are the Components of LT Switch gear? Explain.	10M
	OR	
15. B).	Explain the important characteristics for batteries.	10M

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