AR18

CODE: 18CET205 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular & Supplementary Examinations, March-2021

CONCRETE TECHNOLOGY

(Civil Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Write the chemical composition of ordinary Portland cement and explain their necessity.	5M
	b)	Give the classification of aggregates and also well and gap grading of aggregates.	7M
		(OR)	
2.	a)	Write short notes on admixtures.	5M
	b)	List the tests conducted on aggregates? Explain briefly any one of them?	7M

UNIT-II

3.	a)	Define the term workability and explain the various factors affecting the workability of concrete.	5M
	b)	What are the tests to measure the workability of concrete?	7M
		(OR)	
4.	a)	Determination of Tensile strength (flexure)?	5M
	b)	Define maturity of concrete? What are the limitations on the prediction of strength of concrete from its maturity?	7M

UNIT-III

5.	a)	Explain the purpose of determining the ultrasonic pulse velocity of concrete and the method of determining the UPV of concrete.	7M
	b)	List the factors affecting the creep of concrete?	5M
		(OR)	
6.	a)	List the tests on hardened concrete and explain any two methods as per IS code.	7M
	b)	List the factors affecting the shrinkage of concrete?	5M

UNIT-IV

7.		Design M20 grade concrete as per BIS code for the following data: Maximum size of coarse aggregate - 20 mm, Degree of quality control – good Type of exposure – mild, Specific gravity of cement – 3.15,Specific gravity of fine aggregate – 2.6, Specific gravity of coarse aggregate – 2.6 Assume any missing data suitably.	12M
		(OR)	
8.	a)	What are the factors to be considered in selection of mix proportion?	7M
	b)	Write briefly about durability of concrete?	5M

UNIT-V

9.	a)	List various types of fibres and explain the factors affecting the properties of fiber reinforced concrete.	7M
	b)	Write a short note on no- fines concrete	5M
		(OR)	
10.	a)	Write briefly about polymer and Aerated concretes?	5M
	b)	Explain about high performance concrete.	7M

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AR18

CODE: 18EET206 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular & Supplementary Examinations, March-2021

ELECTRICAL MACHINES-1

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Draw the neat sketch of a DC generator. state the functions of each part. 6M

   b) An 8-pole generator has 500 armature conductors and has a useful flux /pole of 0.065wb. what will be the emf generated if it is lap connected and runs at 1000rpm? what must be the speed at which it is to be driven to produce the same emf if it is wave wound? 6M

(OR)

2. a) Explain the process of commutation in DC generator? 6M

   b) A 220 kW, 4-pole wave connected, 440 V shunt generator has 740 conductors and a shunt field current of 10 A. Find the demagnetizing and cross magnetizing ampere turns per pole, if the brushes are given a lead of 25 electrical degrees. Find the number of additional shunt filed turns to neutralize the demagnetizing effect. 6M

UNIT-II

3. a) Draw and explain internal and external characteristics of shunt and series generators. 6M

   b) The OC curve of a DC shunt generator for a speed of 1000rpm is given by the following table 6M

Filed current (A)	2.0	3.0	4.0	5.0	6.0	7.0
EMF (V)	102	150	188	215	232	245

the shunt has a resistance of 37Ω. find the speed at which excitation may be expected to build up. The armature resistance is 0.04Ω. Estimate the potential difference when the speed is 1000rpm, and armature delivers a current of 100A.

(OR)

4. a) Explain the speed torque characteristics of DC shunt motor 6M

   b) A 6-pole, 500-v wave-connected shunt motor has 1200 armature conductors and use full flux/pole of 20 mWb. The armature and field resistance are 0.5 Ω and 250 Ω 6M

respectively what will be the speed and torque development by the motor when it draws 20A from the supply mains? Neglect armature reaction. If magnetic and mechanical losses amount to 900W, find (i) use full torque (ii) output in kW and (iii) efficiency at this load.

UNIT-III

5. What is the need of the starter? With neat diagram explain the construction and working of three-point starter. 12M

(OR)

6. a) Explain different speed control methods in dc series motor 6M

b) In Hopkinson`s test on 250-v DC machines, the line current was 50A and the motor current 400A not including the field currents of 6 A and 5 A. The armature resistance of each machine was 0.014 Ω. Calculate the efficiency of each machine 6M

UNIT-IV

7. a) Derive the EMF equation of a single phase transformer. 6M

b) A 50KVA transformer has an efficiency of 98% at full load 0.8 PF and 97% at half full load 0.8pf. Determine the full load copper losses and iron losses. Find the load at which maximum efficiency occurs and also the maximum efficiency. 6M

(OR)

8. A 10 KVA, 2500/250 V, single phase transformer has resistance and leakage reactance as follows: $R_1 = 4.8\ \Omega$, $R_2 = 0.048\ \Omega$, $X_1 = 11.2\Omega$ $X_2 = 0.112\ \Omega$. with primary supply voltage held constant at 2500 V, calculate the secondary terminal voltage, when (i) the LV winding is connected to a load impedance of 5 + j3.5 Ω. (ii) the transformer delivers its rated current at 0.8 pf lagging on the LV side 12M

UNIT-V

9. a) Explain scott connection for converting 3-phase into 2-phase supply with neat diagrams 6M

b) With the instruments located on the high-voltage side and low-voltage side short-circuited, the short-circuit test readings for the 50-kVA 2400:240-V side energized gives instrument reading on that side of 240 V, 5.41 A, and 186 W. Determine the efficiency and the voltage regulation at full load, 0.80 power factor lagging 6M

(OR)

10. a) Explain briefly about the Sumner's test? 6M

b) An industrial load takes 100 A at 0.8 pf lag from a 3- phase 11000/400V, 50Hz, Y/Δ transformer. Calculate (i) power consumed by load (ii) kVA rating of transformer (iii) phase and line currents on both HV and LV sides. 6M

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AR18

CODE: 18MET203 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular & Supplementary Examinations, March-2021

FLUID MECHANICS AND HYDRAULIC MACHINES

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Write briefly about different types of Pressure measuring devices 6M
   b) Differentiate between U-tube and Differential Manometer With a neat sketch 6M

(OR)

2. a) Fan delivers 4 m3 of air per second at 200^0C and 1.25 bar. Assuming molecular weight of air as 28.97, calculate the mass of air delivered. Also determine the density, specific volume and specific weight of the air being delivered 6M
   b) Calculate the shear stress developed in oil of viscosity 1.4 poise, used for lubricating the clearance between a shaft of diameter 15 cm and its journal bearing. The shaft rotates at 175 rpm and clearance is 1.5 mm. 6M

UNIT-II

3. a) The velocity potential function is given by $\emptyset = 4(x^2 - y^2)$. Calculate the velocity components at the point (2, 3). 6M
   b) State the momentum equation; In what way does it differ from impulse momentum equation. Mention some of its engineering applications 6M

(OR)

4. a) Define steady flow, non-steady flow, uniform flow, non-uniform flow, compressible flow, incompressible flow, rotational flow and irrational flow 6M
   b) The diameter of a pipe at the section1 and 2 are 10cm and 15cm respectively. Find the discharge through the pipe if the velocity of water flowing through the pipe at section 1 is 5m/s. Determine also the velocity at section2. 6M

UNIT-III

5. Explain with a neat sketch orifice meter and also derive the coefficient of discharge for orifice meter. 12M

(OR)

6. a) Derive the any two minor losses for head loss due to friction. 6M
   b) Derive an expression for the force exerted by the jet of water on a stationary inclined plate 6M

UNIT-IV

7. A pelton wheel has a mean bucket speed of 10 m/s with a jet of water flowing at the rate of 700 litres/sec under a head of 30 metres. The buckets deflect the jet through an angle of 160^0. Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume the coefficient of velocity as 0.98 12M

(OR)

8. a) Show that for the maximum efficiency, the bucket speed of a pelton wheel should be equal to one half of the jet speed 6M
   b) A hydraulic turbine under a head of 25 metres develops 7260 kW running at 110 rpm. What is the specific speed of the turbine? What type of turbine is this? Find also the normal speed and output if the head on the turbine is reduced to 20 metres 6M

UNIT-V

9. a) The internal and external diameters of the impeller of a centrifugal pump are 200 mm and 400 mm respectively. The pump is running at 1200 r.p.m. The vane angles of the impeller at inlet and outlet are 200 and 300 respectively. The water enters the impeller radically and velocity of flow is constant. Determine the work done by the impeller per unit weight of water 6M
   b) A centrifugal pump having an overall efficiency of 80% delivers 1850 liters of water per minute to a height 0f 20 meters through a pipe of 100mm diameter and 95 meters length. Taking f = 0.0075, find the power required to drive the pump. 6M

(OR)

10. a) Compare Reciprocating pump with Centrifugal pump 6M
    b) A double-acting reciprocating pump, running at 40 rpm, is discharging 1.0 m3 of water per minute. The pump has a stroke of 400 mm. The diameter of piston is 200 mm. The delivery and suction heads are 20m and 5m respectively. Find the slip of the pump and power required to drive the pump. 6M

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AR18

CODE: 18ECT205 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular & Supplementary Examinations, March-2021

ELECTRONIC CIRCUITS ANALYSIS

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	What are the advantage and disadvantage of Wien bridge oscillator	4M
	b)	Design a RC phase shift oscillator to generate 5kHz sine wave with 20V peak to peak amplified. Assume h_{fe}=150, C= 1.5nF, h_{fe}=1.2kΩ	8M
		(OR)	
2.	a)	Explain crystal oscillators?	4M
	b)	Explain the principle of operation and derive the expression for colpitts oscillator.	8M

UNIT-II

3.	a)	What is Millers Theorem	4M
	b)	Explain about approximate CE h parameter model. Derive the expression for gain, input impedance and output impedance of CE amplifier	8M
		(OR)	
4.	a)	Explain the operation of Darlington emitter follower with the help of circuit	6M
	b)	Draw the circuit diagram of low frequency common gate FET amplifier and	6M

UNIT-III

5.	a)	What is the effect of cascading on the frequency response of multistage amplifiers? Derive the overall bandwidth of 'n' identical cascading amplifiers.	8M
	b)	What are the advantages and disadvantages of Darlington	4M
		(OR)	
6.	a)	Explain the RC coupled amplified derive gain at mid band frequencies.	8M
	b)	Explain about effect of cascading on gain and bandwidth	4M

UNIT-IV

7.	a)	Derive the expression for CE short circuit current gain (A_I) .	8M
	b)	Define f_T and f_β	4M
		(OR)	
8.	a)	Explain different types of hybrid- π capacitances of a transistor.	4M
	b)	Draw the circuit diagram of emitter follower and high frequency equivalent circuit of emitter follower	8M

UNIT-V

9.	a)	What are the applications of tuned amplifier	4M
	b)	Explain with neat circuit diagram the working of a transformer coupled class 'A' power amplifier	8M
		(OR)	
10.	a)	Explain in detail classification of power amplifier.	4M
	b)	Explain the Complementary Symmetry push pull amplifier,	8M

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AR18

CODE: 18EST206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular & Supplementary Examinations, March-2021

DIGITAL LOGIC DESIGN

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1.	a)	Represent the following decimal numbers in 8-bit signed magnitude form, signed 2's complement form (i) +14 (ii) -37	4M
	b)	Express the function F = A(B+CD) into i) multi-level NAND-NAND and ii) multi-level NOR-NOR.	8M

(OR)

2.	a)	Subtract the following using 2's complement arithmetic: (i) 46-19 (ii) 27-75	4M
	b)	State and prove Boolean laws using Boolean postulates:	8M

UNIT-II

3.	a)	Using K-Map simplify the following expression in POS notation. $F(A,B,C,D) = \sum m(0,1,4,6,8,9,11) + d(2,7,13)$	8M
	b)	Design Half-adder and Full-adder combinational circuits.	4M

(OR)

4.	a)	Implement the full Subtractor circuit using half Subtractor circuits.	4M
	b)	Using the tabulation method, Obtain the set of prime implicants for the Boolean expression $f = \sum m(0,1,6,7,8,9,13,14,15)$.	8M

UNIT-III

5.	a)	Draw 4x1 MUX	2M
	b)	Implement a circuit which convert BCD to Gray	10M

(OR)

6.	a)	Design 8x1 using 4x1 MUX.	6M
	b)	Use a 4X1 MUX to implement the logic function: $f(A,B,C) = \sum m(1,2,4,7)$.	6M

UNIT-IV

7.	a)	Compare PROM, PLA and PAL.	6M
	b)	Realize the Boolean expressions using PLAs: i) $F1(A,B,C) = \sum m(1,3,5,7)$ ii) $F2(A,B,C) = \sum m(0,2,4,6)$	6M

(OR)

8.	a)	Draw and explain the block diagram for PLA.	4M
	b)	Implement the following Boolean functions using a PAL that has four sections with three product terms each: i) $F1(A,B,C,D) = \sum(2,12,13)$ ii) $F2(A,B,C,D) = \sum(7,8,9,10,11,12,13,14,15)$ iii) $F3(A,B,C,D) = \sum(0,2,3,4,5,6,7,8,10,11,15)$ iv) $F4(A,B,C,D) = \sum(1,2,8,12,13)$	8M

UNIT-V

9.	a)	Explain the operation of Johnson counter with neat sketch.	6M
	b)	Design a decade counter.	6M

(OR)

10.	a)	Explain with neat block diagrams about ripple counters and synchronous counters.	6M
	b)	Design a mod-6 asynchronous counter using T flip flops and explain its operation.	6M

AR16

CODE: 16CE2002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March-2021

STRENGTH OF MATERIALS-I

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

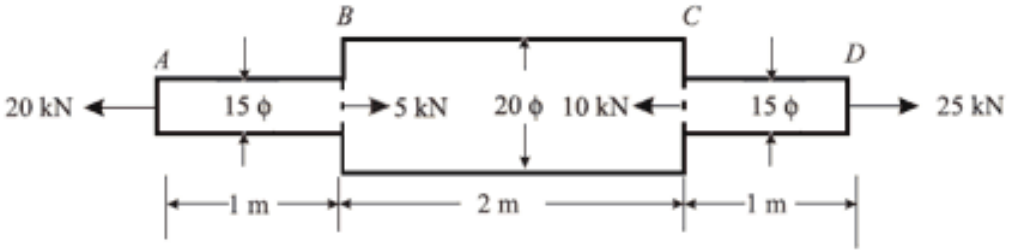
UNIT-I

1. a) A weight of 100N falls freely through 3 m and is then suddenly checked by the reaction of a bar of steel 2 cm in diameter and 9 m long. Find the maximum stress and strain induced in the bar. Take E = 210 GPa. 10M

   b) Determine the Poisson's ratio and the bulk modulus of a material for which the Young's modulus is 200 GPa and modulus of rigidity is 75 GPa. 4M

(OR)

2. a) A steel bar 4m long is subjected to the forces as shown in figure. Find the elongation of the bar. E for the steel is 200 GPa. 10M



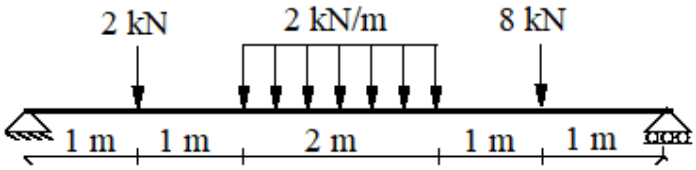
All the diameters of the bar is in mm

   b) An aluminium bar is fixed at both ends. If the temperature of the bar is raised by 25° C, find the stress developed in the bar. The modulus of elasticity and the coefficient of thermal expansion of the material are 80 GPa and 12×10^{-6}/°C respectively. 4M

UNIT-II

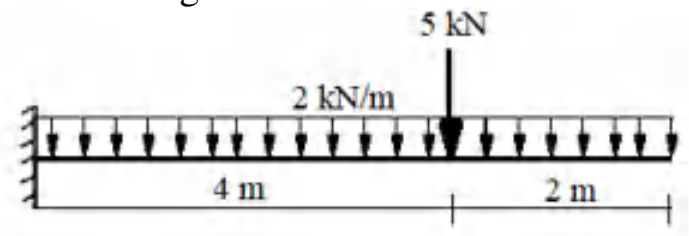
3. a) Define i) Point of contraflexure ii) Shear force iii) Bending moment iv) UDL. 4M

   b) Draw the shear force and bending moment diagrams for the beam loaded as shown in Figure. Clearly mark the position of the maximum bending moment and determine its value. 10M

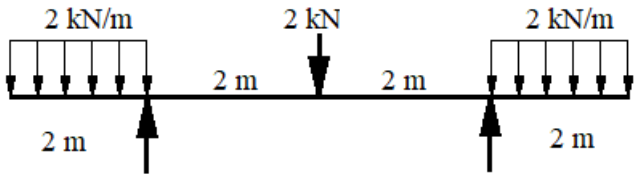


(OR)

4. a) Draw the shear force and bending moment diagrams for cantilever loaded with a point load of 5 kN and an udl of 2 kN/m as shown in Figure. 8M



   b) Draw the shear force and bending moment diagram for the beam shown in figure. Find the maximum bending moment value. 6M



UNIT-III

5. a) State the assumptions made in deriving the simple bending equation. Derive the simple bending equation with the help of neat sketches. 8M

   b) Find the section modulus of hollow rectangle of external width 200 mm and external depth 600 mm. The thickness of the section is 40 mm. 6M

(OR)

6. a) A simply supported beam 10 m long is acted upon by a 10 kN/m U.D.L. throughout its length. Find the size of the rectangular beam if its depth is twice that of its width. Take the allowable bending stress of the material as 40 MN/m^2. 8M

   b) Find the section modulus of hollow circular pipe of external diameter 500 mm. Take the thickness of the pipe as 50 mm. 6M

UNIT-IV

7. a) A timber beam of cross section 80 × 160 mm is subjected to a maximum shear force of 32 kN. Calculate i) Average shear stress ii) Maximum shear stress iii) shear stress at 20 mm from top iv) Shear stress at 40 mm from bottom. 10M

   b) Draw the variation of shear stress across the beam cross section of size 300 mm in diameter when it is subjected a maximum shear force of 400 kN. 4M

(OR)

8. a) An I-section with rectangular ends, has flanges of 15 cm x 2 cm and web of 1 cm x 30 cm. Find the maximum shearing stress developed in the beam for a shearing force of 10 kN. 10M

   b) A simply supported beam of span 4 m carries an udl of 25 kN/m throughout its length. Draw the variation of shear stress at the section 2 m from the left support. The cross section of the beam is 200 mm × 400 mm. 4M

UNIT-V

9. a) A solid steel bar of 40 mm diameter and length 1350 mm is subjected to a uniform torque T. If the allowable shear stress is 40 MPa and the allowable angle of twist is 2.5°, find the maximum permissible torque. Take C=8 x 10^4 N/mm^2. 8M

   b) A closed coil helical spring is to take a load of 150 N. If the mean diameter of the coil is 8 times the diameter of the wire, calculate the diameter of the wire and the coil. The maximum shear stress in the wire should not exceed 85 MPa. 6M

(OR)

10. a) Explain i) Maximum shear stress theory ii) Maximum principal stress theory of failures. 4M

b) A closely coiled helical spring of mean diameter of coil is 80 mm and the wire diameter is 10 mm having 10 coils. If the spring is subjected to an axial twist of 10 kNm, determine the bending stress and increase in the number of turns. Take E=200 GPa. 10M

AR16

CODE: 16EE2007 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March-2021

ELECTRICAL MACHINES-I
(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the working principle of DC Generator and function of Commutator — 7 M
   b) A 300 KW,600 V long shunt compound generator shunt field resistance=75 Ω and armature resistance 0.03 Ω commutation field winding resistance 0.011 Ω , series field resistance = 0.012 Ω , diverter resistance = 0.036 Ω calculate voltage and power generated by the armature — 7 M

(OR)

2. a) What is meant by armature reaction how it effects the DC machines and mention the way to resolve armature reaction in Dc Machines — 7 M
   b) A 4 pole wave wound motor armature has 880 conductors and delivers 120 A. The brushes has been displaced through 3 angular degrees from the geometrical axis calculate
   i) demagnetising ampere turns per pole ii) cross magnetising amp turns per pole iii) additional field winding current for neutralizing the demagnetisation of the field winding has 1100 turns per pole — 7 M

UNIT-II

3. a) Explain the internal and external characteristics of self exited generators and give the applications of each machine based on the characteristics — 7 M
   b) Explain how the process of voltage induces for self excited generators. — 7 M

(OR)

4. a) Explain the significance of Back EMF in DC motor and working principle of a DC motor — 7 M
   b) Determine the developed torque and shaft torque of a 220 V 4 pole series motor with 800 conductors wave connected supplying a load of 8.2 KW by taking 45 A from the mains the flux per pole is 25 m Wb and its armature circuit resistance is 0.06 Ω — 7 M

UNIT-III

5. a) Explain about swinburne test on DC Machine mention its advantages and disadvantages — 7 M

   b) The no load test of 44.76 KW 220 V DC Shunt motor gave the following data input current :13.25 A ,field current :2.25 A , resistance of armature :0.032 ohm and brush drop 2 V calculate full load current and efficiency — 7 M

(OR)

6. a) how a DC Series motor speed can be control what are the types of speed control techniques — 7 M

   b) Explain about ward Leonard method and its application — 7 M

UNIT-IV

7. a) Explain the operation of a transformer with and without load with representation of phasor diagram. — 7 M

   b) A 25 KVA single phase transformer has 250 turns on the primary and 40 turns on the secondary. The primary is connected to 1500 V , 50 Hz calculate the primary and secondary full load currents , secondary emf , maximum flux in the core — 7 M

(OR)

8. a) How all day efficiency differences from normal efficiency. Mentions the types of losses in transformer. — 7 M

   b) A 30 KVA 2400/120 V 50 Hz transformer has a high voltage winding resistance of 0.1 Ω and leakage resistance of 0.22 Ω the low voltage winding resistance 0.035 Ω and the leakage reactance is 0.012 Ω find the equivalent resistance , reactance , impedance refereed to i) High voltage side ii) Low voltage side — 7 M

UNIT-V

9. a) Why we are moving towards a three phase transformer and mention the advantages and disadvantages compared to three single phase transformer using a 3 phase unit — 7 M

   b) mention the condition for parallel operation of transformer for a single and three phase transformers — 7 M

(OR)

10. a) Explain about sumpner test how it is different from OC and SC test — 7 M

    b) In load test of a single phase transformer the following data are primary voltage 210 V and secondary voltage 110 V, primary current 0.5 A , input power 30 W find i) turns ratio ii)magnetising component of no load current iii)working component iv) Iron loss , resistance of the primary winding 0.6 Ohms draw the no load phasor diagram to scale — 7 M

AR16

CODE: 16ME2006 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech. I Sem. Supplementary Examinations, March, 2021

PRODUCTION TECHNOLOGY

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	What are the different allowances provided to pattern? Explain them briefly?	9M
	b)	Explain the CO_2 moulding process?	5M
		(OR)	
2.	a)	Explain the construction & working of Electric arc furnace with a neat sketch?	7M
	b)	Write briefly the different elements in Gating system?	7M

UNIT-II

3.	a)	What are the kinds of joints that are normally employed for welding process? Give their sketches?	7M
	b)	Describe the types of flames obtained in an oxy-acetylene welding?	7M
		(OR)	
4.	a)	Explain the TIG welding process with a neat sketch?	7M
	b)	Describe the Thermit welding process with a neat sketch?	7M

UNIT-III

5.	a)	What is the significance of recrystalization temperature in metal working?	7M
	b)	Describe different rolling –stand arrangements with neat sketches?	7M
		(OR)	
6.	a)	Show by schematic sketches the process of Impact extrusion?	7M
	b)	Describe the Tube drawing process with a neat sketch?	7M

UNIT-IV

7.	a)	What are the various forging methods available in manufacturing? Explain any one method?	7M
	b)	Explain the operations that are normally employed in forging?	7M
		(OR)	
8.	a)	What are the different dies used in sheet metal work? Explain?	10M
	b)	Differentiate between coining and embossing?	4 M

UNIT-V

9.		Explain fallowing methods with suitable figures (i) Magnetic pulse forming and (ii) Electro hydraulic forming	14M
		(OR)	
10.	a)	What are the different properties of plastics? Explain?	7M
	b)	Explain Injection moulding technique with a neat sketch	7M

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AR16

CODE: 16EC2006 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March-2021

ELECTRONIC CIRCUITS – I
(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the operation of Full Wave Rectifier with Induction filter with necessary diagrams. 6M
   b) A diode whose internal resistance is 20Ω is to supply power to a 100Ω load from 110V (R.M.S) source of supply. Calculate: i) Peak Load Current ii) DC Load Current iii) AC Load Current iv) % Regulation from No load to given load. 8M

(OR)

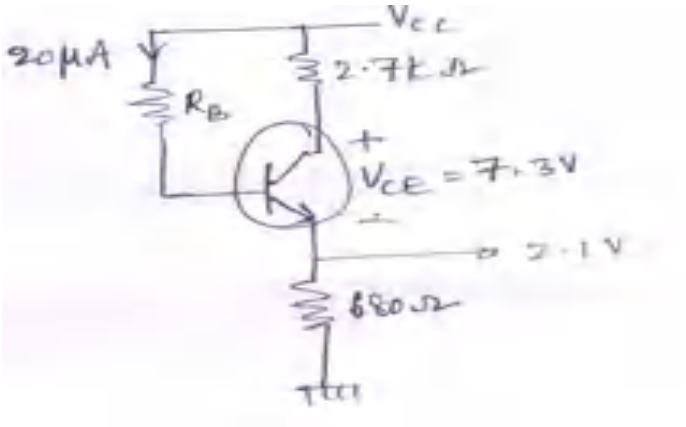
2. a) What is the need for filters in power supplies. 4M
   b) Explain Half wave rectifier with neat sketch. 10M

UNIT-II

3. a) Draw the circuit diagram of fixed bias circuit. Define its stability factors S, S', and S". Mention its disadvantages? 10M
   b) Explain thermal runaway. 4M

(OR)

4. a) Determine β, V_{cc}, R_B for the following circuit. 7M



   b) Derive the stability factor s for a voltage divider bias configuration and explain it in detail. 7M

UNIT-III

5. a) Why hybrid parameters are more useful in analysing circuits having Bipolar Junction Transistor? 7M
   b) Derive the equations for current gain, voltage gain, input and output impedance for Common Emitter Configuration. 7M

(OR)

6. a) Compare various BJT amplifier configurations? 4M
   b) Derive the h parameter equations for current gain, voltage gain, input and output impedance for Common emitter Configuration. 10M

UNIT-IV

7. Explain CE hybrid approximate model and derive R_I,R_0, A_I, A_V 14M

(OR)

8. For the JFET amplifier: g_m = 2 mS, r_{ds} = 30 KΩ, R_s = 3 KΩ, R_D = RL=2 KΩ, R_1 = 200 KΩ, R_2 = 800 KΩ, and R_s = 5 KΩ. if C_C and C_s are large and the amplifier is biased in the pinch off region. Find (a) Z_{in} (b) A_V (c) A_I. 14M

UNIT-V

9. a) Explain different types of negative feedback amplifiers. 10M
   b) Compare negative feedback and positive feedback. 4M

(OR)

10. An amplifier has an input signal of 80 mv to produce a certain output. With a negative feedback to produce the same output, the required input signal is 0.5 V. The voltage gain with feedback is 100. Find the open loop gain and feedback factor. 14M

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AR16

CODE: 16EC2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March-2021

DIGITAL LOGIC DESIGN

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a	Solve for X. i) $(1256)_8 = (X)_2$ ii) $(19.125)_{10} = (X)_8$ iii) $(10011.11)_2 = (X)_{16}$	7M
	b	Realize the function F= AB+BC+CA Using logical Gates.	7M
		(OR)	
2.	a	With examples explain about signed and unsigned numbers.	7M
	b	Explain the procedure to find the complement of a given function with an example.	7M

UNIT-II

3		List out the advantages and disadvantages of K-Map and reduce the following function using K-map. $F(A,B,C,D)= \Sigma\, m(4, 6, 7, 10, 12, 14) + d\,(2, 3, 11, 15)$	14M
		(OR)	
4.		With truth table explain the logic diagram of full adder and realize a full adder using half adders.	14M

UNIT-III

5.		Explain the operation of a 3X8 decoder with truth table and design a 4X16 decoder using 3X8 decoders.	14M
		(OR)	
6.	a	Design 1-bit magnitude comparator	7M
	b	With truth table explain the logic diagram of 8X1 Multiplexer	7M

UNIT-IV

7.	a	Implement $f(A,B,C,D) = \sum m(0,1,3,5,6,8,9,11,12,13)$ using PROM.	7M
	b	Design a full subtractor using PLA.	7M
		(OR)	
8.	a	Compare PROM, PLA and PAL	7M
	b	Design 3-bit binary to gray code converter using PROM.	7M

UNIT-V

9.	a	Convert JK flip flop into D flip flop.	7M
	b	Design a modulo-6 counter using JK flip flops.	7M
		(OR)	
10.	a	Draw and explain the logic diagram of 4 bit Johnson counter.	7M
	b	Explain about T and D flip flops.	7M

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AR13

CODE: 13CE2001 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech. I Semester Supplementary Examinations, March, 2021

STRENGTH OF MATERIALS-I
(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) State Hooke's law.
   b) Draw the bending moment diagram of a simply supported beam when a concentrated load is acting at the midpoint of beam.
   c) What is neutral axis?
   d) Sketch the variation of shear stress over an I section.
   e) What is Macaulay's method?
   f) Draw stress-strain curve for mild steel and indicate salient points.
   g) List any four types of beams.
   h) State any two assumptions made in deriving the bending equation.
   i) What is the ratio of maximum shear stress to average shear stress of a rectangular section?
   j) List any two methods of calculating the slope and deflection at a section of a beam.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

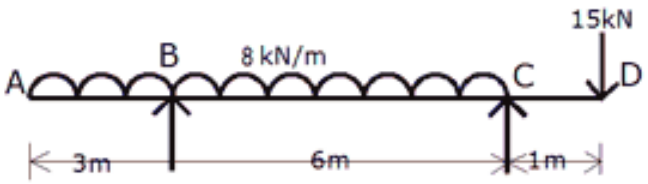
2. a) An axial pull of 4000 N is acting on a bar consisting of three sections of length 30 cm, 25 cm and 20 cm and of diameters 2 cm, 4 cm and 5 cm respectively. If the young's modulus of material is $2x10^5$ N/mm^2. Determine stress in each section and total extension of the bar. 6
   b) A steel tube of internal dia. 100 mm and external dia. 125 mm is surrounded by a brass tube of external dia. 150 mm. The composite bar is subjected to an axial pull of 10 kN. Find the load carried by each tube and the stresses and strains developed in them if E_S = 200 GPa and E_b = 100 GPa 6

(OR)

3. a) A specimen of steel 25mm diameter with a guage length of 200mm is tested to destruction. It has an extension of 0.16mm under a load of 80kN and the load at elastic limit is 160kN .The maximum load is 180kN.The total extension at fracture is 56mm and diameter at neck is 18mm. Find the (i) stress at elastic limit (ii) Young's modulus (iii) Percentage of elongation (iv) Percentage of reduction in area and (v) Ultimate tensile stress. 8
   b) A bar of length 20 cm tapers uniformly from 30 mm dia. to 20 mm dia. calculate the change in its length due to an axial pull of 120 kN, if E = 200GPa. 4

UNIT-II

4. a) Derive the expression for the relation between bending moment and shear force. 4
   b) Draw the shear force and bending moment diagrams.



8

(OR)

5. a) Draw the shear force and bending moment diagram for the beam. 8

b) What do you mean by point of contraflexure and state any one difference between point of contraflexure and point of inflextion? 4

UNIT-III

6. a) Derive the bending equation from first principles. 6
b) Sketch the bending stress distribution across the cross section of a rectangular beam section 230 x 400 mm subjected to 60 KNm moment. 6

(OR)

7. A cantilever of beam I section in 6 m long and is used as a cantilever. The beam is subjected to a uniformly distributed load of 10 kN/m over the entire span. The section of the beam is as follows:
Top flange: 200 mm x 50 mm deep
Bottom flange: 400 mm x 60 mm deep
Web: 50 mm x 200 mm deep
Determine the maximum bending stresses in the beam and draw the bending stress distribution across the cross section. Take E = 2 x 10^5N/mm^2 12

UNIT-IV

8. a) A simply supported wooden beam of span 1.3 m having a cross section 150 mm wide by 250 mm deep carries a point load W at the centre. The permissible stresses are 7 N/mm^2 in bending and 1 N/mm^2 in shearing. Calculate the safe load W. 6
b) Show that for a rectangular section, the maximum shear stress is 1.5 times the average stress. 6

(OR)

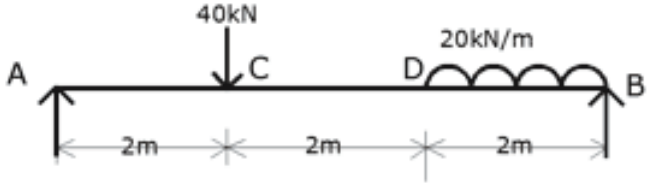
9. An I – section beam 350 mm × 250 mm has a web thickness of 12 mm and flange thickness of 20 mm. It carries a shear force of 120 kN. Sketch the shear stress distribution across the section. 12

UNIT-V

10. A beam of 6 m length simply supported at ends A & B is loaded with two point loads of 60 KN and 50 KN at distance 1 m and 3 m respectively from end A. Determine the deflection under each load and the position and magnitude of maximum deflection in the beam. take E = 2×10^5 N/mm^2 and I = 8500×10^4 cm^4 12

(OR)

11. a) State the first and second moment of area theorems. 2
b) Find maximum deflection and the maximum slope for the loaded as shown in fig. Take EI = 15000 kN-m^2 10



AR13

CODE: 13EE2005 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech. I Sem. Supplementary Examinations, March, 2021
ELECTRICAL MACHINES-I
(Electrical & Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What do you mean by electromechanical energy conversion devices?
   b) What is critical speed in a DC shunt generator?
   c) What is the role of interpoles and compensating winding in DC machine?
   d) State any one effect of armature reaction in DC machines.
   e) List any two advantages of parallel operation of DC generators
   f) State the use of equalizer bars in the parallel operation of DC series generators.
   g) How can the direction of rotation of a DC shunt motor be reversed?
   h) Why starters are used for DC motors?
   i) What type of tests are performed to determine efficiency of DC motors?
   j) What are the components of iron loss in DC machine?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Write the application of single and doubly fed magnetic systems? 2M
   b) With neat sketch, explain the main constructional features of a DC machine. State about the material used for different parts and their function. 10M

(OR)

3. a) Derive the emf equation of a DC machine. 6M
   b) Derive the expression for force in a singly excited magnetic field system 6M

UNIT-II

4. A 250 V, 10 kW, 8 pole DC generator has single turn coils. The armature is wave-wound with 90 commutator segments. If the brushes are shifted by 2 commutator segments at full-load, calculate (i) total armature reaction ampere-turns (ii) demagnetising ampere-turns and (iii) cross-magnetising ampere-turns. 12M

(OR)

5. Explain the concept of armature reaction and its effect on the performance of machine with neat sketch. 12M

UNIT-III

6. a) Explain the voltage build-up process in DC shunt generators. 6M
   b) Explain the load sharing process in parallel operation of DC shunt generators. 6M

(OR)

7. a) Describe about the causes of failure to build-up voltage in a generator. 6M
   b) Explain the load characteristics of DC compound generator 6M

UNIT-IV

8. a) Derive the expression of electromagnetic torque developed in DC Motor 6M
   b) What are the factors on which the speed of a DC motor depends? Explain any one armature control method of DC shunt motor. 6M

(OR)

9. a) Explain the N – I_a Characteristics of DC series motor. 6M
   b) A 152 V DC shunt motor has an armature resistance of 0.3 Ω, a brush voltage drop of 2 V, the rated full load current is 70 A. Calculate (i) the current at the instant of starting as a percentage of full load current (ii) the value of starting resistance to limit the motor current at the instant of starting to 150 percent of the rated load current. 6M

UNIT-V

10. Explain about swinburne's test on DC machine and derive the equation of efficiency when running as both generator and motor. 12M

(OR)

11. Describe the Hopkinson's test for obtaining the efficiency of two similar shunt machines. 12M

AR13

CODE: 13ME2005 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech. I Sem. Supplementary Examinations, March, 2021

PROUCTION TECHNOLOGY
(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Define casting process
   b) Name important pattern materials.
   c) What is gating ratio?
   d) What are the major defects in casting?
   e) What is camber allowance?
   f) How is brazing different from welding?
   g) Name the types of flames produced in Oxy-Acetylene Welding?
   h) Define Extrusion
   i) Distinguish punching and piercing operations
   j) What is meant by die forging ?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Explain the mould making process in casting process
   b) Explain types of patterns and their allowances

(OR)

3. a) Describe shell molding process and write its applications
   b) Describe CO_2 molding process and write its applications

UNIT-II

4. a) Describe the classification of welding processes
   b) Explain the principle of arc welding process

(OR)

5. a) Explain TIG welding process and its applications
   b) Explain MIG welding process and its applications

UNIT-III

6. a) Explain hot working and cold working process
   b) Explain various advantages and disadvantages of rolling process?

(OR)

7. a) Define Rolling process and explain different rolling stand arrangements with neat sketches?

UNIT-IV

8. a) Distinguish between forward extrusion and backward extrusion process?
   b) Describe i) Tube drawing ii) Wire drawing

(OR)

9. a) Explain i) Die forging ii) press forging
   b) Describe i) Blanking ii) Spinning iii) Coning

UNIT-V

10. a) Explain the Explosive forming and its applications
    b) What are various advantages of high velocity forming process over other processes

(OR)

11. a) Explain magnetic pulse forming
    b) Describe various types of plastics

AR13

CODE: 13EC2006 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March-2021

DIGITAL LOGIC DESIGN

(Common to CSE and IT)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Differentiate between weighted codes and non-weighted codes
   b) convert 378.9310 to octal
   c) Convert 5C716 to decimal .
   d) What is the difference between canonical form and standard form ?
   e) Define Demultiplexer
   f) The NAND gate output will be low if the two inputs are --
   g) What is a counter ?
   h) What is Asynchronous Circuit?
   i) Half Adder is For----
   j) What is Excess-3 code?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Express the following numbers in decimal. 6
      i) $(10110.0101)_2$ ii) $(16.5)_{16}$ iii) $(26.24)_8$
   b) Perform the subtraction with the following unsigned numbers by using 2's complement method 6
      (i) 100-110000 (ii) 11010-1101

(OR)

3. a) Prove the following Boolean theorems using postulates. 6
      a. x. x = x b. x + x.y = x
   b) Obtain the dual and complement of the following function 6
      i) A'B +A'BC'+A'BCD+A'BC'D'E

UNIT-II

4. a) Reduce the following 4 variable function to its minimum sum of products form 6
      Y= A'B'CD' + ABCD'+AB'CD' + AB'CD + AB'C'D' +ABC'D'+A'B'CD + A'B'C'D'
   b) Obtain minimal SOP expression for the given Boolean function using K-map F(A ,B,C,D)= ∑(0,1,4,6,8,9,10,12))+d(3,7,11,13,14,15) 6

(OR)

5.	a)	Describe 4-bit binary parallel adder using a truth table and realize it using appropriate number of full-adders.	6
	b)	Describe 4-bit adder-subtractor circuit with neat logic circuit.	6

UNIT-III

6.	a)	Construct a 4-to-16 line decoder with five 2-to-4 line decoders with enable.	6
	b)	Implement the following Boolean function with 8:1 Multiplexer $F(A,B,C,D) = \sum m(0,3,5,8,9,10,12,14)$	6
		(OR)	
7.	a)	Explain the working of a Demultiplexer with the help of example.	6
	b)	Explain the code converters with the help of example.	6

UNIT-IV

8.	a)	Explain about Programmable logic devices?	6
	b)	Implement the following function by using PROM i) $F1= \sum m(0,2,5,6,7,8,9,10,12)$ ii) $F2= \sum m(1,2,3.4,6,7,8,11,13,14,15)$	6
		(OR)	
9.	a)	Implement the circuit using PAL $A(x,y,z) =\sum m(1,2,4,6)$, $B(x,y,z) =\sum m(0,1,3,6,7)$, $C(x,y,z) =\sum m(1,2,4,6,7)$	6
	b)	Compare PAL, PLA and PROM?	6

UNIT-V

10.	a)	Describe the behaviour of JK Flip-flop in detail using truth table/ characteristic table .	6
	b)	Describe the D Flip Flop in detail using Truth table .	6
		(OR)	
11.	a)	Design a 4-bit Universal shift register, realize the design through a circuit and describe it using function table.	6
	b)	Design and explain in detail a 4-bit synchronous binary counter that would count downwards with control	6

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