AR18

CODE: 18CET205 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October / November, 2019

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)	What are Bouge's compounds? Explain in detail how each one of these compounds influence the strength properties of cement?	7M
	b)	Explain setting time of cement and factors effecting setting time of cement ?	5M
		(OR)	
2.	a)	Discuss the classification of aggregate according to origin , size and shape.	7M
	b)	Describe the soundness test of cement.	5M

UNIT-II

3.	a)	What is workability? Explain the factors affecting workability	7M
	b)	Explain different types of curing.	5M
		(OR)	
4.	a)	Explain different methods of batching of ingradients of concrete	6M
	b)	Explain the affect of segregation and bleeding on strength of concrete	6M

UNIT-III

5.	a)	Explain the split tensile strength test of concrete?	7M
	b)	Write a short note on Shrinkage of concrete.	5M
		(OR)	
6.	a)	Explain different modulii of Elasticity of concrete	6M
	b)	Explain the Behaviour of creep with time	6M

UNIT-IV

7.	a)	Explain the factors in the choice of mix proportions.	6M
	b)	Explain statistical methods and Acceptance criteria	6M
		(OR)	
8.	a)	Design a concrete mix for the following data for M-40 as per IS code Method Type of cement – Ordinary Portland, Fine aggregate natural river sand conforming to grading zone II of Table 4, of IS: 383-1970. Coarse aggregate – Crushed (angular), coarse aggregate of 20 mm maximum size conforming to IS: 383 code requirements. Specific gravities of cement, sand and coarse aggregate are 3.14, 2.63 and 2.61 respectively. Type of exposure mild Degree of quality control – very good Degree of workability 0.80 for M-40. Assume the necessary data.	12M

UNIT-V

9.	a)	Write about Fibre reinforced concrete.	6M
	b)	Explain Self compacting concrete	6M
		(OR)	
10.	a)	Briefly Explain Light weight aggregate concrete.	6M
	b)	Discuss the advantages of cellular concrete	6M

AR18

CODE: 18EET206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October / November, 2019

ELECTRICAL MACHINES-I

(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)	Explain the principle of operation of D.C. generator.	6M
	b)	Derive the EMF equation of DC generator.	6M
		(OR)	
2.	a)	How demagnetizing and cross-magnetizing ampere-turns per pole are calculated in a DC machine.	6M
	b)	A 4 pole, 23.75 kW, 250 V lap wound dc shunt generator has 50 slots with 8 conductors per slot and a shunt field resistance of 50 ohms. The brushes are given a lead of 8^0 (mechanical) when the generator delivers full load current. Calculate the number of turns on the compensating winding if the pole arc/pole shoe pitch ratio is 0.8.	6M

UNIT-II

3.	a)	Explain the characteristics of D.C. Series Motor	6M
	b)	A 6-pole, 230 V DC series motor has a flux per pole of 4mWb/Amp over the working range of the magnetisation curve which is assumed to be linear. The load torque is proportional to speed squared and its value is 20 N-m at 800 rpm. There are 432 wave-connected conductors and the total resistance of motor is 1.0 ohm. Determine the motor speed and current when this motor is connected to rated supply voltage.	6M
		(OR)	
4.	a)	What is critical field resistance of DC shunt generator? What is its significance?	6M
	b)	Explain the classification of DC motors.	6M

UNIT-III

5.	a)	Explain Swinburne's test to determine the efficiency of a DC Shunt generator. What is the limitation of Swinburne's test?	6M
	b)	In a Hopkinson's test on a pair of 500 V, 100 kW shunt generator. The following data was obtained: Auxiliary supply 30 A at 500 V; Generator output current 200 A; Field current 3.5 A and 1.8 A; ra = 0.075 Ω for each machine; voltage drop at brushes = 2 V/machine; calculate the efficiency of the machine as a generator.	6M

(OR)

6. Explain the construction and working of 3-point starter. What is the limitation of it? 12M

UNIT-IV

7. a) Derive the emf equation of a single phase transformer and explain with phasor diagram. 6M

   b) A transformer is rated at 2300/230 V, 15 kVA and 50 Hz. Assume that the transformer is operating at 80% p.f., leading and at rated output the secondary terminal voltage is 230 V. The following parameters for the transformer are given: N_1 = 1500 turns N_2 = 150 turns r_1 = 2.7 ohms r_2 = 0.024 ohms x_1 = 9.1 ohms x_2 = 0.088 ohms, I_0 = 0.15A, Core loss = 92W. Copper loss = 50W Calculate voltage regulation and efficiency of the transformer. 6M

(OR)

8. a) A transformer has its maximum efficiency of 0.98 at 15 kVA at upf. Compare its all-day efficiencies for the following load cycles:
   (i) Full load of 20 kVA 12 hours/day and no-load rest of the day.
   (ii) Full load 4 hours/day and 0.4 full-load rest of the day.
   Assume the load to operate on upf all day. 6M

   b) Explain various losses in a transformer and its efficiency. 6M

UNIT-V

9. a) Explain Sumpner's test to determine the efficiency of the transformer, and what are the advantages of it over remaining methods 6M

   b) The following readings were obtained from O.C. and S.C. tests on 8 kVA 400/120V, 50-Hz transformer. O.C. Test: (l.v. side) : 120 V; 4 A; 75 W. S.C. Test: (h.v.side) : 9.5 V; 20 A; 110W. Determine Voltage regulation and efficiency at 0.8 power factor lagging. 6M

(OR)

10. a) A 240V/120V, 12 kVA transformer has full-load unity pf efficiency of 96.2%. It is connected as an auto-transformer to feed a load at 360 V. What is its rating and full-load efficiency at 0.85 pf lagging? 6M

    b) The 2000/200-V, 20-kVA transformer of Ex. 3.7 is connected as a step-up autotransformer as in Fig. 3.38 in which AB is 200 V winding and BC is 2000-V winding. The 200-V winding has enough insulation to withstand 2200-V to ground. Calculate (i) the LV and HV side voltage ratings of the autotransformer; (ii) its kVA rating; (iii) kVA transferred inductively and conductively; (iv) its efficiency at full-load 0.8 pf. 6M

AR18

CODE: 18MET203 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October / November, 2019

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) Define and explain Newtons law of viscosity. 4M
   b) Two horizontal plates are placed 1.25 cm apart, the space between them being filled with oil of viscosity 14 poises. Calculate the shear stress in oil if upper plate is moved with a velocity of 2.5 m/s. 8M

(OR)

2. a) The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of sp.gr. 0.9 is flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm. 8M
   b) The pressure inside a soap bubble of 50 mm diameter is 2.5 N/m^2 above the atmosphere. Estimate the surface tension of the soap film. 4M

UNIT-II

3. a) Explain stream line, path line and streak line. 6M
   b) Derive continuity equation in cartisian co-ordinates 6M

(OR)

4. a) Derive Euler's equation along a stream line 6M
   b) The water is flowing through a pipe having diameters 20 cm and 10 cm at sections 1 and 2 respectively. The rate of flow pipe is 35 litres/sec. The section 1 is 6 m above datum and section 2 is 4 m above datum. If the pressure at section 1is 39.24 N/cm2, find the intensity of pressure at section 2. 6M

UNIT-III

5. a) Define an orificemeter. Prove that the discharge through an orifice-meter is given by the relation 6M

   $Q = C_d \frac{a_0 a_1}{\sqrt{a_1^2 - a_0^2}} \times \sqrt{2gh}$ Where a_1 = area of pipe in which orifice-meter is fitted a_0 = area of orifice

   b) An oil of specific gravity 0.8 is flowing through a venturimeter having inlet diameter 20 cm and throat diameter 10 cm. The oil-Hg differential manometer shows a reading of 25 cm. Calculate the discharge of oil through the horizontal venturimeter. Take C_d=0.98. 6M

(OR)

6. a) An old water supply distribution pipe of 250 mm diameter of a city is to be replaced by two parallel pipes of smaller equal diameter having equal lengths and identical friction factor values. Find out the new diameter required. 6M

b) Show that the force exerted by a jet of water on moving inclined plate in the direction of jet is given by $F_x = \rho a(V-u)^2 \sin^2\theta$ 6M

UNIT-IV

7. a) Derive the expression for specific speed of a turbine . 4M

b) A pelton wheel is to be designed for the specifications: 8M
Shaft power = 11,772 kW; Head = 380 meters; speed = 750 r.p.m; overall efficiency = 86%; Jet diameter is not exceed one-sixth of the wheel diameter. Determine:
(i) The wheel diameter (ii) The number of jets required, and
(ii) (iii) Diameter of the jet.

(OR)

8. a) Obtain an expression for unit speed, unit discharge and unit power of a turbine. 6M

b) A turbine is to operate under a head of 25 m at 200 rpm. The discharge is 9 m^3/sec. If the efficiency is 90%, determine the performance of the turbine under a head of 20 meters. 6M

UNIT-V

9. a) Derive an expression for minimum starting speed of a centrifugal pump. 4M

b) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000rpm works against a total head of 40m. The velocity of flow through the impeller is constant and equal to 2.5m/s. The vanes are set back at an angle of 40^o at outlet. If the outer diameter of the impeller is 500mm and width at outlet is 50mm, determine; (i) vane angle at inlet (ii) work done by impeller on water per second and (iii) manometric efficiency. 8M

(OR)

10. a) Explain about working of a single reciprocating with neat sketch. 6M

b) A single acting reciprocating pump, running at 50 r.p.m., delivers 0.01 m^3/s of water. The diameter of the piston is 200 mm and stroke length 400 mm. Determine: (i) The theoretical discharge of the pump, (ii) coefficient of discharge, and (iii) slip and the percentage of the slip. 6M

***

AR18

CODE: 18ECT205 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October / November, 2019

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)	Write short notes on Crystal oscillator with circuit	4M
	b)	Draw and explain RC phase shift oscillator using BJT and derive an expression for frequency of oscillations.	8M
		(OR)	
2.	a)	Draw the circuit of Hartely oscillator and explain its operation. Derive the expression for the frequency of oscillations.	6M
	b)	Draw the circuit of a Wein bridge oscillator and explain its operation .	6M

UNIT-II

3.	a)	Draw the simplified hybrid model for the CC circuit and derive the expressions for A_I, R_i	6M
	b)	The transistor is connected as common emitter amplifier and h parameter are h_{ie} =1100Ω, h_{re} = 2.5 x 10-4 , h_{fe} = 50, h_{oe}=24μ A/V. if R_L= 10k and R_s = 1K find A_i, R_i, A_v, A_{vs}, A_{is} and R_o	6M
		(OR)	
4.	a)	Comparison the Transistor Amplifier Configurations	4M
	b)	Draw approximate model of CE amplifier with an emitter resistor fine A_I, A_V, R_i and R_o	8M

UNIT-III

5.	a)	Three identical cascaded stages have overall upper 3db frequency of 30KHz a lower 3 dB frequency 50Hz. What is lower and upper 3dB of each stage ?	6M
	b)	Explain the Band pass cascaded Amplifier	6M
		(OR)	
6.	a)	Explain the Effect of emitter bypass capacitor on low frequencies	2M
	b)	Explain two stage RC coupled amplifier with frequency response characteristics.	10M

UNIT-IV

7.	a)	Derive the expression for Gain bandwidth product and what is the effect of load resistance on it.	6M
	b)	Explain high frequency CS amplifier and derive the expression for voltage gain.	6M
		(OR)	
8.	a)	Derive the expression for CE short circuit current gain A_i	8M
	b)	Draw the hybrid-π model of CE Amplifier	4M

UNIT-V

9.	a)	Explain Class A circuit biasing with necessary diagrams	6M
	b)	Explain Class AB circuit biasing using BJT's	6M
		(OR)	
10.	a)	Explain single tuned and stagger tuned amplifiers with relevant circuits.	8M
	b)	Explain the Thermal stability and Heat sink.	4M

***

AR18

CODE: 18EST206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, October / November, 2019

DIGITALLOGICDESIGN

(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)	Convert the decimal digit 250.5 into i) Binary ii) Octal iii)Hexadecimal.	6M
	b)	Stare and prove Demorgan's theorem.	6M
		(OR)	
2.	a)	Perform subtraction for the binary numbers using i)1's complement and ii)2's complement 11010-1101	6M
	b)	Reduce the Boolean expression to the minimum number of literals. $Y = (A + C + D)(A + C + D')(A + C' + D)(A + B')$	6M

UNIT-II

3.		Simplify the given Boolean function using K-map and draw using basic gates. $F(ABCD) = \sum m(0,2,4,9,12,15) + \sum d(1,5,7,10)$	12M
		(OR)	
4.		Design a 4-bit Carry look-a-head adder and draw the circuit.	12M

UNIT-III

5.	a)	Implement $F(ABCD) = \sum m(0,1,3,4,8,9,15)$ using 8×1 MUX.	6M
	b)	Design a BCD to Excess-3 code converter.	6M
		(OR)	
6.	a)	Design a Full-adder using NAND gates.	6M
	b)	Design a 3-bit Gray to Binary code converter.	6M

UNIT-IV

7.		Implement the following Boolean functions with PLA having 3 inputs, 4 products and 2 outputs. $F_1(ABC) = \sum (0,1,2,4)$ $F_2(A, B, C) = \sum (0,2,4,6)$	12M
		(OR)	
8.		Obtain the PLA program table from the BCD to Excess-3 code converter.	12M

UNIT-V

9.	a)	Design and draw Mod-6 synchronous counter.	8M
	b)	Explain race around condition.	4M
		(OR)	
10.	a)	Draw and explain the Master-slave JK-Flip-flop.	6M
	b)	Design a mod-10 ripple counter	6M

***

AR16

CODE: 16CE2002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October / November, 2019

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) Express the relations between E, G, K, & μ. 4m

   b) A compound tube consist of a steel tube 140mm internal dia and 160mm external dia and an outer brass tube 160mm internal diameter and 180mm external diameter. The two tubes are of the same lengths. The compound tube carries an axial load of 900 KN. Find the stress and load carried by each tube and the amount it shortens. Length of each tube is 140mm. Take E for steel $2x10^5$ N/mm^2 and for brass as $1x10^5$ N/mm^2. 10 m

(OR)

2. a) A vertical bar fixed at the upper end and of uniform strength carries an axial tensile load of 600 KN. The bar is 20m long and having weight per unit volume as 0.00008 N/mm^3. If the area of the bar at the lower end is 400 mm^2, find the area of the bar at the upper end. 7m

   b) A steel bar is 900mm long: its two ends are 40mm and 30mm in diameter and the length of the each rod is 200mm. The middle portion of the bar is 15mm in diameter and 500mm long. If the bar is subjected to an axial tensile load of 15KN. Find its total extension. Take E= 200 GN/m^2 (G stands for giga and IG= 10^9). 7m

UNIT-II

3. a) What are the variations of S.F and B.M for different loadings on the spans of beam? 4m

   b) A cantilever of length 2m carries a uniformly distributed load of 1.5KN/m run over the whole length and a point load of 2KN at a distance of 0.5m from the free end. Draw the S.F and B.M diagrams for the cantilevrs. 10m

(OR)

4. a) Draw S.F.D & B.M.D for a cantilever carrying a load whose intensity varies uniformly from W KN at the fixed end to zero per unit run at the free end. 4m

b) Draw the shear and bending moment diagrams for the beam and loading shown 10m

UNIT-III

5. a) What do you mean by 'simple bending' and 'pure bending'? 4m

b) The simply supported beam has a rectangular cross section 120 mm wide and 200 mm high and span of 8m this carrying a UDL 10kN/m (i) Compute the maximum bending stress in the beam. (ii) Sketch the bending stress distribution over the cross section on which the maximum bending stress occurs. (iii) Compute the bending stress at a point on section B that is 25 mm below the top of the beam. 10m

(OR)

6. a) A beam has a rectangular cross section 80 mm wide and 100 mm deep. It is subjected to a bending moment of 15 kN-m at a certain point along its length. It is made from metal with a modulus of elasticity of 180 GPa. Calculate the maximum stress on the section. 4m

b) A cast iron beam is of I section of dimensions 100mm x100mm x 20mm. the beam is simply supported on a span of 8m. The beam carries a uniformly distributed load of 1.5 KN/m Length on the entire span. Determine the maximum tensile and compression stresses. 10m

UNIT-IV

7. Derive expression for shear stress distribution for rectangular section. 14m

(OR)

8. The shear force acting on a section of a beam is 50KN. The section of the beam is of rectangular shape of dimensions 100mm x150mm. The moment of inertia about the horizontal neutral axis is 314.221×10^4 mm^4.calculate the shear stress at the neutral axis. 14m

UNIT-V

9. a) Find the maximum shear stress induced in a solid circular shaft of 15cm diameter when the shaft transits 150KW power at 180 r.p.m. 6m

b) A hallow shaft is to transmit 300KW power at 80 r.p.m if the shear stress is not to exceed 60N/mm2 and the internal diameter is 0.6 of the external diameter, find the external and internal diameters assuming that the maximum torque is 1.4 times the mean. 8m

(OR)

10. A hallow shaft having an inside diameter 60% of its outer diameter is to replace a solid soft transmitting the same power at the same speed. Calculate the percentage saving in material, if the material to be used is also the same. 14m

***

CODE: 16EE2007 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November,2019

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 principle of operation of a DC generator with neat diagrams.	7M
	b)	Derive the EMF equation of Dc generator.	7M
		(OR)	
2.		What is commutation in DC machines and explain the process with relevant diagrams and graph.	14M

UNIT-II

3.	a)	Define torque. Derive the expression for torque developed by a D.C. motor.	7M
	b)	A 500-V D.C. shunt motor draws a line-current of 5 A on light-load. If armature resistance is 0.15 ohm and field resistance is 200 ohms, determine the efficiency of the machine running as a generator delivering a load current of 40 Amps.	7M
		(OR)	
4.	a)	Explain the characteristics of DC motor.	7M
	b)	A d.c. series motor takes 40 A at 220 V and runs at 800 r.p.m. If the armature and field resistance are 0.2 Ω and 0.1 Ω respectively and the iron and friction losses are 0.5 kW, find the torque developed in the armature. What will be the output of the motor ?	7M

UNIT-III

5.	a)	Explain with the help of a neat sketch the principle of operation of a four-point starter.	10M
	b)	Explain the necessity of starter.	4M
		(OR)	
6.	a)	Elaborate the various speed control methods of a DC shunt motor.	7M
	b)	Explain retardation test conducted on dc machine.	7M

UNIT-IV

7.	a)	Explain the operation of transformer on no load with a neat vector diagram	8M
	b)	Derive the EMF equation of single phase transformer.	6M
		(OR)	
8.	a)	Derive the condition for zero and maximum regulation of a transformer	6M
	b)	A 30 Kva ,2400/120 V,50 Hz transformer has a high voltage winding resistance of 0.2 ohm and leakage reactance is 0.012 ohm. Find the equivalent winding resistance ,reactance and impedance referred to i)HV side ii) LV side.	8M

UNIT-V

9.	a)	Explain about the short circuit test of a single phase transformer and give its significance?	7M
	b)	What is sumpner's test and explain its principle with a neat circuit diagram	7M
		(OR)	
10.		Write in detail about Scott connection of transformers and mention their applications.	14M

AR16

CODE: 16ME2006 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October / November, 2019

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	Explain about various types of allowances in casting? What are methods available to compensate the shrinkage with respect to alloy and pure metal in casting?	8M
	b	Explain with neat sketch Shell moulding and CO_2 moulding process and compare its advantages and disadvantages.	6M
		(OR)	
2.		What are elements of gating system and explain requirements of each gating elements in the system with diagram? Also explain the design principle of gating system.	14M

UNIT-II

3.	a	Explain the working principle of arc welding with neat sketch and discuss in detail about the two major applications of arc welding process.	8M
	b	Explain spot welding and seam welding process with net diagram and discuss their major applications.	6M
		(OR)	
4.		Explain the laser beam welding process and discuss about laser material interaction with an example. Also discuss about the advantages, disadvantages and applications of laser beam welding process.	14M

UNIT-III

5.	a	Explain about importance of metal forming process compared to casting and welding process. Discuss about features of cold, warm and hot working process.	8M
	b	Derive the angle of bite or deformation angle with assumptions in rolling process.	6M
		(OR)	
6.	a	Explain the following terms with neat diagram i) Forward Extrusion ii) Backward Extrusion iii) Impact extrusion iv) Hydrostatic extrusion	10M
	b	Suggest a suitable process to reduce the diameter of 10 mm rod into 1 mm diameter of wire. Explain step by step procedure of the process with neat diagram.	4M

UNIT-IV

7.	a	Explain with neat sketch various types forging operations.	6M
	b	Classify the forging operation based on forging die. Explain the terms such as flash and gutter in forging operation.	8M
		(OR)	
8.		Discuss the punching and blanking operation with respect to size, clearance and shear point of view with neat diagram.	14M

UNIT-V

9.	a	What are the advantages of high velocity forming process? Explain electro hydraulic forming with neat sketch.	8M
	b	Explain the principle of magnetic pulse forming with neat sketch and discuss its major applications.	6M
		(OR)	
10.	a	What are different types of plastics? Explain their advantages, limitation and its applications.	8M
	b	Suggest a suitable process to make Water bottle and explain step by step procedure of the process with neat diagram.	6M

***

AR16

CODE: 16EC2006 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October / November, 2019

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)	Draw the circuit diagram of a half-wave rectifier, and explain its operation	7M
	b)	Derive an expression for ripple factor in a full-wave rectifier using inductor filter.	7M
		(OR)	
2.	a)	Explain inductor filter and capacitor filter.	7M
	b)	Draw the circuit diagram of a bridge-wave rectifier, and explain its operation	7M

UNIT-II

3.	a)	Draw a fixed bias circuit and derive an expression for the stability factor	7M
	b)	Explain the stabilization of Q point using sensistor and thermistor .	7M
		(OR)	
4.	a)	Explain Therimistor and Sensitor Compensation techniques	8M
	b)	Draw and explain a self-bias circuit (Voltage divider bias).	6M

UNIT-III

5.	a)	Draw the hybrid model of transistor in CE configuration.	10M
	b)	List out the advantages of transistor hybrid parameters	4M
		(OR)	
6.	a)	Draw the general h parameter model of a transistor suitable for any configuration. Derive expressions for voltage gain, current gain, input impedance and output impedance.	10M
	b)	Compare CE, CB, CC configurations.	4M

UNIT-IV

7.	a)	Derive simplified CE h parameter model of a transistor.	10M
	b)	Explain how the FET acts as an amplifier	4M
		(OR)	
8.	a)	Draw the low frequency model of FET and explain it	7M
	b)	Analyze CE with R_e circuit using h- parameter model.	7M

UNIT-V

9.	a)	If the input resistance of an amplifier is 100KΩ and output resistance is 10 KΩ. What will be the input resistance and output resistance of a current shunt feedback amplifier with gain 100 and feedback factor 0.99	7M
	b)	Explain the effect of negative feedback on bandwidth and sensitivity	7M
		(OR)	
10.	a)	List out the different types of negative feedback amplifiers (Topolozies) and draw their block diagrams	7M
	b)	Explain the concept of feedback and write the advantages of negative feedback	7M

AR16

CODE: 16EC2011 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, October / November, 2019

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) Write the difference between Analog systems and Digital system. 4M
   b) Convert the following: 10M
      i) $360.15_{(8)}$ to Decimal and then to Binary.
      ii) $234_{(10)}$ to Octal and then to Hexa decimal.

(OR)

2. a) i) State Duality Theorem. 7M
      ii) Obtain the dual of the function (A+B)(C+D)= AC+AD+BC+BD
   b) Simplify the following expression and realize the reduced function using the basic gates. 7M
      Y=A'B'C'D'+A'BC'D'+A'B'C'D

UNIT-II

3. Reduce the following Logic function 14M
   F(A,B,C,D)= $\sum$ m(0,1,2,5,6,8) +d (3,4,7,14) using the appropriate variable K- Map method in Sum of products form. Also realize the reduced expression using basic gates.

(OR)

4. a) Design a full adder circuit using necessary half adders. 7M
   b) Design a 2-bit by 2-bit binary multiplier. 7M

UNIT-III

5. a) Design a 4-line- to- 16- line Decoder using 3-line to 8 line decoders using an enable input. 7M
   b) Implement a Boolean function $F(x,y,z)= \sum m(1,2,6,7)$ using a 4:1 Multiplexer. 7M

(OR)

6. a) Design a Full adder circuit using universal gates. 7M
   b) What is a Magnitude comparator? Explain how an Exclusive OR Gate is used as a basic comparator. 7M

UNIT-IV

7. a) Draw and Explain the structure of PROM. 4M
   b) Design a PROM. Structure to implement the following Boolean function. 10M
   $F_{1=} \sum m(0,2,5,7)$
   $F_{2=} \sum m(1,3,4)$
   $F_{3=} \sum m(0,2,3,5,7)$
   $F_{4=} \sum m(1,2,3,5,6,7)$

(OR)

8. Design a PAL circuit to implement the following combinational logic functions 14M
   $X_1= \sum m(1,2,3,5,7,8,10,12,14)$
   $X_2= \sum m(7,11,13,14,15)$

UNIT-V

9. a) Explain how Master- Slave JK flip-flop avoids the race around condition. 7M
   b) Convert a JK flip-flop to T-flip flop with the help of conversion table. 7M

(OR)

10. Explain how different kinds of data shifts can take place in Universal shift register, with a neat logic diagram. 14M

***

AR13

CODE: 13CE2001 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019

STRENGTH OF MATERIALS-I
(Civil Engineering)

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

PART-A

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

1. a) Define beam
   b) Define simple Stress
   c) Write the Mathematical relation between Shear force F and rate of loading w kN/m
   d) No. of Point of contra flexures in simply supported beam
   e) In Simply supported beam Max compressive bending stress is developed at
   f) Bending stress at the neutral axis is
   g) Ratio of Max shear stress to average shear stress of rectangular cross section is
   h) Location of the maximum shear stress in a triangular cross section of height H is
   i) The maximum slope for a cantilever Beam of span L and subjected to UDL of w kN/m is
   j) The maximum slope for a cantilever Beam of span L and subjected to UDL of wkN/m is

PART-B

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

UNIT-I

2. a) Define Elasticty and Plasticity 2M
   b) A copper rod, 12mm dia and 400mm long fits into an aluminium tube of external diameter 20mm and internal diameter 12mm of equal length. If the assembly is held together by a rigid plate at the end and is stress free at 20^{o}c, find the stress induced in the two materials when it is heated to 60^{o}c. For Copper, E=120GPa and $\alpha=18x10^{-6}/^{o}$c. For Aluminium ,E=70GPa and $\alpha=23x10^{-6}/^{o}$c 10M

(OR)

3. a) Define the Following i) Poisons Ratio and ii) Volumetric Stain 4M
   b) Two solid cylindrical rods AB and BC are welded together at B and loaded as shown in Fig.1 Take d_1=30 mm and d_2=50 mm. Find the average normal stress in the mid-section of (a) rod AB (b) rod BC 8M

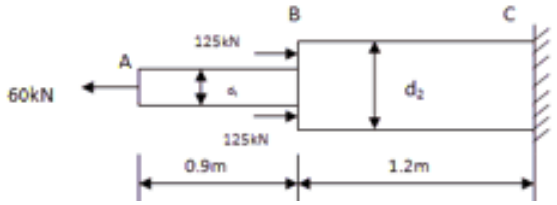


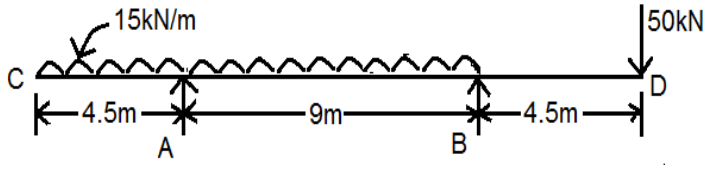
Fig.1

UNIT-II

4. a) Derive the Relation between Shear force and Bending Moment 6M
   b) A simply supported beam of length 6m is carrying a uniformly distributed load of 3 kN/m from the right end. Draw the S.F and B.M diagrams for the beam. 6M

(OR)

5. Construct S.F and B.M diagrams for the loaded beam shown 12M



UNIT-III

6. a) Write any FOUR assumptions in theory of simple bending. 4M
   b) Derive the simple bending Equation 8M

(OR)

7. A cast iron beam is of I section having top flange of 80mm wide and 20 mm thick and web of height 210 mm and thickness of web is 20 mm. The bottom flange is 180 mm wide and 40 mm thick. The beam is simply supported over a span of 5 m. If the tensile stress is not to exceed 20 Mpa, Find the safe UDL which the beam can carry. Also find the max compressive stress. Show the bending stress diagram. 12M

UNIT-IV

8. a) Prove that for a rectangular section the maximum shear stress is 1.5times the average shear stress. Sketch the variation of shear stress across the cross-section. 6M
   b) Derive the expression for shear stress at a section, $q = \frac{FAY}{Ib}$ 6M

(OR)

9. The Shear force acting on a section of a beam is 100KN. The section of the beam is of T-shaped with 250mm flange width and overall depth 300mm. The flange thickness and web thickness are 50mm. Find the shear stress at neutral axis and at the junction of the web and flange. 12M

UNIT-V

10. A beam of uniform section 10 m long , is simply supported at the ends it carries point loads of 110 kN and 60 kN at a distance of 2m, 5m respectively from the left end. Calculate the deflection under each load and maximum deflection. Given E= $200X10^6$ N /m^2 and I = 118 $x10^{-4}$ m^4. 12M

(OR)

11. a) A girder of uniform section and constant depth is freely supported over a span of 2.5 meters. Calculate the central deflection and slope at the ends of the of the beam under a central load of 25 kN. given: Ixx=$7.807x10^{-6}$ m^4 And E=200 GN/m2. 6M
   b) A Cantilever beam of Length 3 M subjected to an UDL of 5kN/m over the entire Length of the beam ,if Ixx=$3.807x10^{-6}$ m^4 And E=200 GN/m^2.Determine maximum slope and Maximum Deflection 6M

***

AR13

CODE: 13ME2005 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019
PROUCTION TECHNOLOGY
(Mechanical Engineering)

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

PART-A

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

1. a) What are the main advantages of casting?
   b) What is the function of riser and runner?
   c) What is gating ratio?
   d) What are the functions of flux used in cupola?
   e) Write the causes of casting defects for (i) hot tears (ii) cold shuts
   f) How is brazing different from welding?
   g) Name the types of flames produced in Oxy-Acetylene Welding?
   h) Define Extrusion
   i) Distinguish blanking and piercing operations
   j) What is meant by upset forging ?

PART-B

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

UNIT-I

2. a) Enumerate the characteristics of moulding material.
   b) Explain the advantages and disadvantages of casting process?

(OR)

3. a) Enumerate the CO_2 process casting and its advantages
   b) Describe the Shell moulding process and its applications

UNIT-II

4. a) Describe TIG welding process and its applications
   b) Describe submerged metal arc welding process and its applications

(OR)

5. a) Describe the thermit welding process.
   b) Write a short note on LBW detailing the applications

UNIT-III

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

(OR)

7. Explain different rolling stand arrangements with neat sketches?

UNIT-IV

8. a) Explain with sketches the differences between direct and indirect extrusion
   b) Write a short notes on i) Wire drawing ii) Tube drawing

(OR)

9. a) Explain i) Impact extrusion process ii) Hydrostatic extrusion process
   b) Explain i) Blanking ii) piercing iii) Spinning

UNIT-V

10. a) Explain electro hydraulic forming with neat sketch
    b) What are various advantages of high velocity forming process over other processes?

(OR)

11. a) Explain magnetic pulse forming with neat sketch
    b) Explain various plastic moulding processes

***

AR13

CODE: 13EC2002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019
ELECTRONIC CIRCUITS-I
(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

PART – A

Answer all questions **[10 x 1=10M]**

1. a) Draw the characteristics of zener diode
   b) What is the ripple factor of full wave rectifier.
   c) What are the factors that effects the stability of transistor operating point
   d) What are the operating regions of a transistor
   e) List out any two applications of CC amplifier
   f) Draw the hybrid model of transistor in CE configuration
   g) Compare between CE and CB of BJT amplifier
   h) What is the significance of emitter bypass capacitor
   i) Define trans-conductance of transistor at high frequencies
   j) What is the relation between f_T and f_β

PART – B

Answer one question from each unit **[5 x 12=60M]**

UNIT – I

2. a) Explain inductor filter with neat diagram.
   b) Explain how Zener diode acts as a voltage regulator

(OR)

3. a) Compare the performance of L-section and π-section filters?
   b) A full - wave single phase rectifier employs a π- section filter consisting of two 4 μF capacitors and a 20 H choke. The transformer voltage to the center tap is 300 Vrms. The load current is 500mA. Calculate the dc output voltage and the ripple voltage. The resistance of the choke is 200Ω

UNIT -II

4. Explain self bias circuit and derive stability factor.

(OR)

5. a) What is meant by transistor biasing and describe various biasing schemes
   b) An npn transistor with β=50 is used in CE amplifier with Vcc=10V, Rc=2KΩ and bias is obtained byconnecting a 100KΩ resistance from collector to base. Find the Q-point.

AR13

CODE: 13EC2002 **SET-1**

UNIT-III

6. a) Define h-parameters of a transistor amplifier.
   b) Derive h-parameters of common emitter amplifier.

(OR)

7. a) Draw the small signal model of JFT and define the FET parameters
   b) Give the approximate H-parameter conversion formulae for CB and CE configuration in terms of CC.

UNIT-IV

8. a) Explain frequency response characteristics of RC coupled amplifier.
   b) Compare AV, AI, Ri and Ro of CE, CB and CC configurations.

(OR)

9. With the help of exact and approximate hybrid model derive the expressions for current gain, voltage gain, input impedance and output impedance of CE amplifier

UNIT-V

10. Explain hybrid- π common emitter transistor model with equivalent circuit.

(OR)

11. Derive Hybri-π conductance and capacitance.

***

AR13

CODE: 13EC2006 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November, 2019
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) Convert the octal number $(6734)_8$ to decimal number.
   b) Calculate using 2's complement 5-6.
   c) Draw the basic gates using NAND gates.
   d) What is meant by priority encoder.
   e) Prove dual of 1st Demorgan's theorem is 2nd theorem.
   f) Draw the half adder using NAND gates.
   g) What is PROM.
   h) What is purpose of clock in flipflop.
   i) What type of flipflop are used in Johnson counter.
   j) Draw NAND latch circuit.

PART-B

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

UNIT-I

2. a) Convert the following numbers to decimal. 6M
      i) $(12103)_4$ ii) $(2467)_8$ iii) $(ABC)_{16}$
   b) i) Obtain the 2's complement of binary 11011010. 6M
      ii) Obtain the g ray code for binary number 10110101.
      iii) Obtain the 9's complement of the decimal number:3567

(OR)

3. a) Simplify the Boolean expression. 6M
      i) T(xyz) = (x+y) [(x'(y'+z')]'+x'y'+x'z'.
      ii) Z=[AB'(C+BD) +A'B']C
   b) Convert the following expression to standard sum of products form. F = (AB+C) (B+AC). 6M

UNIT-II

4. Simplify the Boolean function using K-map 12M
F(ABCD)= ∑m (1,2,3,4,7,9) + ∑d 10,11,12,1314,15).

(OR)

5. Draw and explain the operation of 4-bit carry look ahead adder. 12M

UNIT-III

6. a) Draw and explain 4×1 multiplexer. 6M
   b) Construct full adder using 3×8 decoder and OR gates. 6M

(OR)

7. Design BCD to excess-3 code converter circuit. 12M

UNIT-IV

8. Implement the circuit with PLA 12M
$F_1(ABC) = \sum (0,1,3,4)$ $F_2(ABC) = \sum (1,2,3,5,6)$

(OR)

9. Implement the combinational circuit for the function with PAL F(ABCD) = ∑ (0,2,5,7,8,10,12,13). 12M

UNIT-V

10. a) Draw and explain the operation of JK master slave flipflop. 6M
    b) Draw and explain 4-bit buffer register. 6M

(OR)

11. Design Mod 10 up/down counter. 12M

***

AR13 SET 02

CODE:13EE2005

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, October / November,2019
ELECTRICAL MACHINES – I
(Electrical & Electronics Engineering)

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

PART – A

Answer all questions **[1X10=10]**

1. a) Write the expression of field energy for a doubly excited system
   b) What is the relationship of field energy and co-energy in a linear system?
   c) Why armature winding in dc machines are usually closed type and double layer winding
   d) What are the methods adopted to reduce reactance voltage during commutation
   e) What are the necessary conditions for parallel operation of DC shunt generators?
   f) Define critical speed in dc machines
   g) What are the different losses in dc machines and state the condition for maximum efficiency
   h) What are the different types of starter used for dc motor?
   i) Specify the condition of swinburne's test and explain why it is called loss summation method
   j) What are the different methods of speed control in dc motors?

PART-B

Answer one question from each unit **[5 X12 = 60]**

UNIT-I

2. Draw the lap winding diagram of a 4 pole 16 slot double layer dc armature winding. Specify the position of brushes. [12M]

(OR)

3. a) A shunt generator supplies a load of 12.5kW at 125V. The field resistance is 250 Ω and the armature resistance is 0.1 Ω. The total voltage drop because of brushes is 3.5V. Calculate the induced armature voltage. [6M]
   b) A separately excited generator, when running at 1200 r.p.m., supplies 200 A at 125 V to a constant resistance. What will be the current when the speed is dropped to 1000 r. p. m. if the field current is unaltered? Armature resistance: 0.04 Ω; total drop at brushes: 2 V; ignore change in armature reaction. [6M]

UNIT-II

4. a) What are the major practical problem caused due to armature reaction? [4M]
   b) Explain the principle of operation of DC generator. [8M]

(OR)

5. a) What are the different problems associated with commutation? What is resistance commutation? [4M]
   b) A 10hp, 230 V shunt motor takes a full-load line current of 40A. The armature and the field resistances are 0.25 Ω and 230 Ω, respectively. The total brush voltage drop is 2V and the core and friction losses are 380 W. Calculate the input and output power of the motor. [8M]

UNIT-III

6. a) Draw and explain the external and internal characteristic of dc series generator.. [5M]

b) A separately excited generator gave the following data for open circuit characteristics at 1100 rpm.

If (A)	0	0.2	0.4	0.6	0.8	1.0	1.2	1.4
Ea (V)	5	50	100	140	170	190	200	205

The armature resistance including brushes is 0.5 ohm. If the generator is now shunt connected and is driven at 1100 rpm, then for a total shunt field resistance of 180 Ω, Calculate (i) critical field resistance (ii) critical speed. [7M]

(OR)

7. a) Draw and explain the external and internal characteristics of cumulatively and differentially compound dc generator. Show how these characteristics differ from flat compound machine. Find one potent application of each of the compound machine. [8M]

b) Two DC generators running in parallel supply a total load current of 200 A. The terminal voltage of one generator falls uniformly from 240 to 225 V when delivering 120 A. The terminal voltage of second generator falls uniformly from 230 to 215 V when delivering 100 A. Find the load current shared by each generator and the bus-bar voltage. [4M]

UNIT-IV

8. A 200 V, DC shunt motor takes 22 A at rated voltage and runs at 1000 rpm. Its field resistance is 100 Ω and armature circuit resistance (including brushes) is 0.1 Ω. Calculate the value of additional resistance required in the armature circuit to reduce the speed to 800 rpm when,
   i) The load torque is independent of load
   ii) Load torque proportional to speed
   iii) Load torque varies as square of the speed. [12M]

(OR)

9. a)What is the need of a starter? Discuss the starting method of a dc shunt motor showing how the speed builds up. [5M]

b) Describe the different component and operation of a three point starter with a neat sketch. What are the limitations of a three point starter? [7M]

UNIT-V

10. a) Specify the conditions for performing hopkison's test. What are the advantages of hopkinson's test. [4M]

b) Two similar coupled machines of same rating, each having an armature resistance of 0.5 Ω are connected for Hopkinson's test. Test data recorded as follows: Supply voltage = 230 Volts, Total line current drawn from the supply = 8 A, Field current of the machine running as generator = 3 A, Field current of the machine running as motor = 2 A, Generator armature current = 17 A
   (i) Estimate the rotational loss of each machine.
   (ii) Estimate the efficiency of the generator.
   (iii) Estimate the efficiency of the motor. [8M]

(OR)

11. a) Write short notes on the following
   (i) Swinburne test for generator
   (ii) Condition for maximum efficiency for generator [6M]

b) The following readings are obtained when doing a load test on DC shunt motor using a brake drum:-

Spring balance reading	10Kg and 35 Kg	diameter of the drum	40cm
Speed of the motor	950rpm	Applied voltage	200V

Line current 30A. Calculate the output power and efficiency. [6M]