Code No. 11013

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I-Semester (Backlog) Examination, November / December 2018

Subject: Strength of Materials – I

Time: 3 hours **Max. Marks: 75**

Note: Answer all questions from Part-A and any FIVE questions from Part-B.

PART-A (25 Marks)

1. Draw a stress – strain diagram for mild steel and high carbon steel 3
2. What do you understand by the term *statically indeterminate problem?* 2
3. Differentiate between a plane bending and oblique bending 3
4. What is a distributed load? 2
5. Draw a shear stress distribution over rectangular section and I-Section. 2
6. Explain the method of joints 3
7. List the types of stresses induced and also show the variation of these stresses across the thickness of a thin cylinder 3
8. State Lame's equations 2
9. Explain Rankine's theory of failure 3
10. Write an expression for equivalent bending moment and equivalent twisting moment 2

PART-B (50 Marks)

11. a) Derive the expression for elongation of bar of uniform section due to self weight 5
    b) A vertical tie of uniform circular cross-section is 5 m long and hangs from a ceiling. The diameter of the bar is 2.5cm. It carries a weight of 25kN at its lowest end. Calculate the total elongation of the bar if unit weight and Young's modulus of the tie's material is 76 and 206 GPa respectively. 5

12 A simply supported beam AB of 9m span carries a point load of 20 kN at a distance of 3m from the support A and a uniformly distributed load of 6 kN/m throughout the span. Draw the S.F. and B.M. diagrams. Indicating principal values. 10

13 Write the assumptions of theory of simple bending and derive the bending equation. 10

14 A reinforced concrete wall is 2 m wide and 6m high. It retains water upto 5.5 m height from bottom of the wall. Test stability of the wall against tension, crushing, sliding and overturning. Take unit weight of reinforced concrete as 25, bearing capacity of soil as 240 kN/m^2 and coefficient of friction as 0.4 10

15 A thick cylinder 150 mm inside diameter and 300 mm outside diameter is subjected to an internal fluid pressure of 60 MPa. Calculate the maximum and minimum intensities of hoop stress and sketch distribution of hoop stress and radial pressure across the section. Also determine the increase in inside and outside diameter of the cylinder. Young's modulus and Poisson's ratio is 200 GPa and 0.33 for material of the cylinder respectively. 10

..2

16 Direct stresses of 60 MPa (tension) and 60 MPa (compression) are applied to an elastic material at a point on planes at right angles to one another. The maximum principal stress in the material is to be limited to 80 MPa. Determine shearing stress may the material be subjected on the given planes. Also determine the minimum principal stress, maximum shear stress and resultant stress on the planes of maximum shear stress. 10

17 A shaft transmits 400 kW power @ 200 r.p.m. The allowable shear stress is 80N. Density of the material is 78 kN Determine (i) The necessary diameter of solid circular shaft, (ii) The necessary diameter of hollow circular section, the inside diameter being 3/4 of the external diameter and (iii) Percentage saving in material if the hollow shaft is used. 10

****

Code NO. 11019

FACULTY OF ENGINEERING

B.E 2/4 (EEE) I-Semester (Backlog) Examination, November / December 2018

Subject: Principles of Mechanical Engineering

Time: 3 Hours **Max. Marks : 75**

Note: Answer All questions From Part-A and any FIVE questions From Part-B.

PART-A (25 Marks)

1. Define COP of a Heat Pump.
2. Define critical radius of insulation of heat.
3. Define Mechanical and Thermal efficiency of an IC engine.
4. Define and classify Boilers
5. Sketch Gear Trains
6. Differentiate between Open and Cross belt drive
7. Define specific speed of turbines.
8. State Bernoullis equation.
9. What is Cavitation in pumps.
10. Draw the ideal indicator diagram for reciprocation pump.

PART-B (50 Marks)

11. a) What is conduction. Derive Fouriers law of heat conduction.
    b) Explain the working of air refrigeration system with the help of P-V and T-S diagrams.

12. a) Differentiate between Petrol and Diesel engines with respect to 1) fues 2) cycle 3) power
    b) Explain the working of Closed cycle gas turbines.

13 Derive the expression for length of belt case for cross belt drive

14 a) Explain the working of Orifice meter. State its applications.
    b) A Pelton wheel is having a mean bucket diameter of 1m and is running at 1000rpm. The net head on the Pelton wheel is 700m. If the side clearance angle is 15^o and discharge through nozzle is 0.1m3/s find
    1) Power available at the nozzle and 2) Hydraulic efficiency of the turbine

15 a) Derive the expression for effect of acceleration head in reciprocating pump, also draw indicator diagram showing this effect.
    b) A centrifugal pump delivers water against a net head of 14.5 meters and a design speed of 1000rpm. The vanes are curved back to an angle of 30^o with the periphery. The impeller diameter is 300mm and outlet width 50mm. Determine the discharge of the pump if nano metric efficiency is 95%.

16 a) Give applications of Heat Exchangers.
    b) Define and Classify Boilers. According to industrial application

17 a) Find the speed of a shaft which is driven with the help of a belt by an engine running at 200rpm. The diameter of the engine pulley is 51 cm and that of shaft is 30cm.
    b) What are friction losses in pipes.
    c) Draw the indicator diagram of reciprocating pump showing the effect of friction during suction and delivery strokes.

****

Code No: 11021

FACULTY OF ENGINEERING

BE 2/4 (Inst.) I-Semester (Backlog) Examination, Nov./Dec. 2018

Subject: Elements of Production Techniques

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A, & any Five questions from Part-B.

PART – A (25 Marks)

1. Explain the functions of core, core print and chaplets. (3)
2. List the criteria for selection of manufacturing process (2)
3. Differentiate between brazing and welding. (3)
4. Discuss the significance of electrode and flux in arc welding? (2)
5. What is the difference between up and down milling? (3)
6. What are the advantages of numerical control machining? (2)
7. List out merits and demerits of EDM. (3)
8. Explain the principle of material removal in USM. (2)
9. What are the advantages of forging processes? (3)
10. Define forming? Write its classifications. (2)

PART – B (50 Marks)

11. a) Write the classification of moulding processes. (5)
    b) Sketch and explain die casting process. (5)
12. a) State and explain arc welding process. (5)
    b) Distinguish between spot, butt welding and soldering. (5)
13. a) Explain the working principle of drilling machines. (5)
    b) Differentiate between up milling and down milling process? (5)
14. a) Sketch and explain laser beam machining. (5)
    b) List out the advantages, disadvantages and applications of EBM. (5)
15. a) Sketch and explain the deep drawing process. (5)
    b) Discuss the principle of rolling and explain different rolling mills. (5)
16. a) Explain the steps involved in making a sand casted part. (5)
    b) Write are the various metal joining techniques. (5)
17. Write short notes on the following: (10)
    (a) Powder metallurgy.
    (b) Taper turning.
    (c) Gas welding.

****

Code No. 11026

FACULTY OF ENGINEERING

B.E 2/4 (ECE) I-Semester (Backlog) Examination, November / December 2018

Subject: Elements of Mechanical Engineering

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A and any five questions from Part-B

PART-A (25 Marks)

1. A fluid in a cylinder is at a pressure of 800 kN/m^2. It is expanded at constant pressure from a volume of $0.26m^3$ to a volume of $1.65m^3$.Determine the work done in kJ.
2. Draw the two stage air compression process on p-V and t-s plane and name the processes.
3. Explain the Stefan –Boltzmann law of radiation.
4. Draw the temperature profiles along the length of parallel flow and counter flow heat exchangers.
5. COP of a heat pump=4.85 and it draws heat at a temperature of 255K. Calculate the ratio of higher temperature to lower temperature.
6. Compare VAR system with VCR system.
7. What are the applications of Brazing, soldering and welding?
8. Distinguish between gas welding and arc welding processes.
9. Define machine and mechanism.
10. A pulley 0.65m in diameter is running at a speed of 1500rpm with a belt having thickness of 12mm.Estimate the velocity of the belt in m/min.

PART-B (50 Marks)

11 a) Describe the working of Vapor compression refrigeration system with a line diagram and mention its applications. 5

b) An air refrigerator operates between pressure limits of 1 bar and 10 bar on Bell Coleman cycle. Air enters the compressor and enters the expander at 30C. The compression and expansion follows the law of $PV^{1.25}$=Const. determine i) COP ii)Work done per kg of air. 5

12 a) A single stage single acting air compressor delivers air at a pressure of 6 bar. The intake temperature is 35ºC, pressure is 1.1bar and volume of air entering the compressor is $4.5m^3$/min, Index of compression is 1.25.Estimate the power required to run the compressor. 5

b) Describe the working of two stroke petrol engines. 5

13 a) Determine the rate of heat transfer through the boiler wall of 25mm thickness steel plate which is covered with an insulating material of 10mm thick. The temperatures at the inner and outer surfaces of the wall are 450ºC and 55ºC respectively. Assume K for steel as 62W/mK and for insulation as 0.215W/mK. 5

b) Derive an expression for the heat loss in W/m^2 through a composite wall of two layers i)without considering convective heat transfer coefficient ii) with considering convective heat transfer coefficient. 5

..2

14 a) Explain the sand casting process in detail with appropriate sketches. 5
b) Describe with sketches the different rolling mills used in steel industry. 5

15 a) Describe the working of inverted gear train and mention its advantages and applications. 5
b) A belt drive is designed to transfer power of 25kW at a belt speed of 15m/sec. the ratio of tight side and slack side belt tensions is 3.2. Estimate the angle of lap and belt tensions. Take μ=0.25. 5

16 a) Steam enters a steam turbine with a velocity of 45m/sec, enthalpy 2600kJ/kg and leaves with a velocity of 92m/sec and enthalpy of 2000kJ/kg. Heat losses from the turbine are 250kJ/min and the steam flow rate is 1.4kg/sec. Determine the power developed by the turbine in kW. 5
b) Discuss the basic modes of heat transfer with two examples in each mode. 5

17. Answer ***any two*** of the following: 5+5
a) Describe the working of thermo electric refrigeration system.
b) Explain the working of (SMAW) shielded metal arc welding process with a sketch.
c) Explain the working of compound belt drive with a sketch and mention its applications.

****

Code No: 11031

FACULTY OF ENGINEERING

BE 2/4 (M/P/A.E) I-Semester (Backlog) Examination, November/December 2018

Subject: Managerial Economics and Accountancy

Time: 3 Hours **Max. Marks: 75**

Note: Answer All Questions From Part-A & Any Five Questions From Part-B.

PART-A (25 Marks)

1.	Define Capital Budgeting	3
2.	What are Production Decisions?	3
3.	What is the Importance of Demand Forecasting?	2
4.	Define Break-Even Point	3
5.	Define Market	2
6.	What is Equilibrium of the Firm?	2
7.	Define Payback Method	3
8.	What is understood by Fixed Working Capital?	2
9.	Define Contra – Entry	3
10.	What is the use of Petty Cash Book?	2

PART-B (50 Marks)

11. Explain the Role and Functions of a manager in business organization.

12. Explain the Law of Demand and exceptions to the Law of Demand.

13. Explain the ISO- quant Production function.

14. The initial cash outlay of a project is Rs. 30,000 and it can generate cash inflows of Rs. 2,000, Rs. 4,000 and Rs. 24,000 in year 1 through 3. Assume a 10% discount rate. Calculate Payback and NPV.

15. Define Working Capital, Distinguish between Permanent and Temporary Working Capital.

16. State the assumptions and limitations of Break Even Analysis.

17. Discuss the Principles of Accounting.

****

Code No. 11038

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I – Semester (Backlog) Examination, November / December 2018

Subject: Basic Electronics

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1	Define Cut in voltage of diode? What are its values for silicon and germanium diode	2
2	What is breakdown in diodes? How it is useful?	2
3	What is early effect?	2
4	What are the advantages of JFET over BJT?	2
5	What is Bark hausen criteria?	2
6	What are disadvantages of positive feedback?	3
7	Draw the circuit for OP-AMP as summer. Write the final equation of its output	3
8	What are the universal gates and write their truth table.	3
9	What LED is preferred over LCD?	3
10	What are the applications of CRO in different fields?	3

PART – B (5x10 = 50 Marks)

11	a)	Define drift current and Diffusion current. What is Mobility? Write all the required equations.	5
	b)	Explain the working of Zener diode as regulator. Draw a single regulator using zener diode that give output as 3v, 7v, 9v and 11v.	5
12	a)	Draw Common emitter amplifier and write the equations for its voltage and current gain. What is the effect of negative feedback on gain and bandwidth of amplifier	5
	b)	What are H-parameters and what are its limitations?	5
13		Draw a neat circuit diagram of the Hartley oscillator and derive the frequency of oscillations and condition for Oscillations.	10
14	a)	Draw the Full Subtractor using basic logic gates and write the truth table.	5
	b)	What are the characteristics of ideal OP-AMP? Draw the equivalent circuit of OP-AMP.	5
15	a)	Explain the construction and working of SCR.	5
	b)	Explain the V-I Characteristics of SCR	5
16		Explain the construction working of CRO.	10
17		Write short notes on any two:	
	a)	Rectifies and filters	5
	b)	Feedback topologies	5
	c)	Strain Gauge	5

****

Code No. 11042

FACULTY OF ENGINEERING

B.E. 2/4 (IT) I-Semester (Backlog) Examination, November / December 2018

Subject : Data Structures

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	Define ADT	2
2	How we can analyse the performance of algorithm.	3
3	Given the binary traversal of binary tree. Draw the tree PREORDER : DQBAFNG INORDER : QBDNFAG	3
4	What is the maximum length from start to finish for any maze dimension m x p?	3
5	What is hashing? List out few hashing functions.	3
6	Write a recursive function to reverse a linked list.	2
7	Given a binary tree with 18 nodes, what is the minimum possible depth of the tree.	2
8	Define red black tree with example.	3
9	List and explain the representation of graph.	2
10	List down the applications of queue.	2

PART – B (50 Marks)

11	a)	Write a C++ program for implementing a string ADT.	5
	b)	Write a C++ function to traverse the doubly linked list from left to right, printing out the contents of data field of each node.	5
12	a)	Develop and test a complete C++ template class for linked stacks.	5
	b)	Write C+ code to implement following operation on queue by linked representation. i) Delete ii) Insert	5
13		Write a C++ program for implementing linked queue.	10
14	a)	Write algorithms for DFS graph traversal.	4
	b)	Write C++ code to implement Kruskals algorithm	6
15	a)	Write a C++ program that implement linked insertion sort. What is best case of this sorting?	6
	b)	Write C++ code to implements Prim's algorithm.	4
16		Define a heap. Write algorithm for heap sort. Trace heap sort for following keys 5,1,3,8, 5,7,6,5,9. Find time complexity.	10
17		Write short notes on : a) Merge sort b) Threaded binary tree	10

******

Code No: 11383

FACULTY OF ENGINEERING

B. E. 2/4 (EE/Inst.) I-Semester (Backlog) Examination, November / December 2018

Subject: Electronics Engineering-I

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A, & Answer any FIVE Questions from Part-B.

PART-A (25 Marks)

1 Explain the operation of half wave rectifier. [2]
2 Explain the breakdown mechanism in a diode. [3]
3 Explain about Tunnel diode with diagram. [3]
4 Draw circuit diagram of LED. [2]
5 What is meant by early effect in BJT? [2]
6 When a reverse voltage of 12V is applied between gate and source of JFET, the gate current is 0.002μF. Determine the resistance between gate and source. [3]
7 What are h-parameters? [2]
8 Compare low frequency pi and T models in BJT. [3]
9 With neat diagram explain FET as a switch. [3]
10 What is CC amplifier? [2]

PART-B (5x10=50 Marks)

11 (a) Derive diode current equation under forward bias and reveres bias conditions. [5]
(b) Explain p-n junction operation and draw V-I characteristics and band diagrams. [5]

12 What is rectifier? Explain with the neat diagram the working principle of full-wave rectifier. Derive the expression for ripple factor of full-wave centre tapped transformer. [10]

13 (a) Explain with suitable diagram operation of UJT. [5]
(b) Compare CC, CB and CE configuration of BJT. [5]

14 (a) Explain in detail about difference amplifier. [4]
(b)Consider a two stage CE-CC cascade amplifier having $h_{ie}=h_{ic}=2K$; hfe=50; hfc=-51; $h_{re}=6x10^{-4}$ $h_{rc}=1$ and $h_{oe}=h_{oc}=25\mu A/V$ find the input impedance, voltage gain and current of individual stage as well as combination. Assume values if required. [6]

15 (a) Explain in detail deplection and enhancement MOSFET with suitable diagram. [5]
(b) Discuss about JFET operation with neat diagram. [5]

16 (a) Describe the Zener voltage regulator and its limitations. [5]
(b) Describe the construction and working of TRIAC. [5]

17 Write short notes on the following [10]
(a) CRO
(b) BJT biasing Techniques

****

Code No. 11385

FACULTY OF ENGINEERING

B.E. II- Semester(Supply) Examination, November / December 2018

Subject : Electrical Technology

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

Note : Answer all questions from Part-A and any Five Questions from part-B

PART – A (20 Marks)

1 What is the purpose of yoke in a DC machine. [2]

2 Give the significance of back emf in a DC motor. [2]

3 In three phase system, what do you mean by balanced load. [2]

4 Write the relation between the line and phase voltages and currents in a balanced delta connected load. [2]

5 Draw the vector diagram of 3-phase alternator for lagging p.f load. [2]

6 What is the significance of regulation of 3-phase alternator? [2]

7 What is the purpose of laminating the core in a transformer? [2]

8 How transformers are classified according to their construction? [2]

9 A 3-phase, 6 pole, 50 Hz induction motor has a slip of 4% at full load. Find the synchronous speed and the frequency of rotor current at full load. [2]

10 Why single phase induction motor has low power factor? [2]

PART – B (50 Marks)

11. a) Explain simple lap winding for DC machine with help of neat schematic diagram. [5]

b) A 6 pole, wave-wound DC generator has 75 conductors & 12m Wb flux/pole. Determine the speed of the armature if the induced emf is 400V. What will be the speed when it is lap wound and generating 400V? Armature reaction weakens the field by 3%. [5]

12. a) Derive the torque equation of a DC motor. [5]

b) Explain the speed control of DC shunt motor with help of neat circuit diagrams. [5]

13. a) Show with a relevant phasor diagram how power factor can be measured by two wattmeter method in 3-phase system. [5]

b) Three similar coils each having resistance of 12 Ω and reactance of 10 Ω are connected in star across a 420 V, 3 phase supply. Determine the total power and reading of each wattmeters connected to measure power. [5]

14. a) With sketches explain the constructional features of salient pole and non-salient pole alternators. Where are the two types used. [5]
    b) A 3-phase, 4 pole, star connected alternator revolves at 1500 rpm. The stator has 90 slots and 8 conductors per slot. The flux per pole is 0.06 Wb. Calculate the line voltage generated by alternator, if the winding factor is 0.97. [5]

15. a) Explain the principle of operation of auto transformer with help of neat circuit diagram. [5]
    b) Explain OC and SC tests conducted on 1-phase transformer with help of neat circuit diagrams. [5]

16. a) Explain the slip –torque characteristics of an 3-phase induction motor. [5]
    b) Explain the constructional detail and principle of operation of shaded pole motor with help of neat schematic diagram. [5]

17. Write short notes on the following: (10)
    a) Auto-transformer.
    b) Production of rotating magnetic field.
    c) Synchronous impendence.

****

Code No. 11388

FACULTY OF ENGINEERING

B.E. II - Semester (Suppl.) Examination, November / December 2018

Subject : Basic Electrical Engineering

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

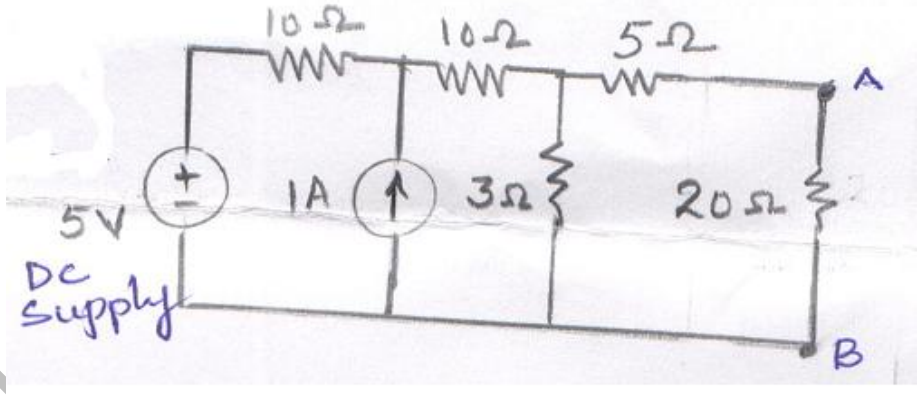
Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (20 Marks)

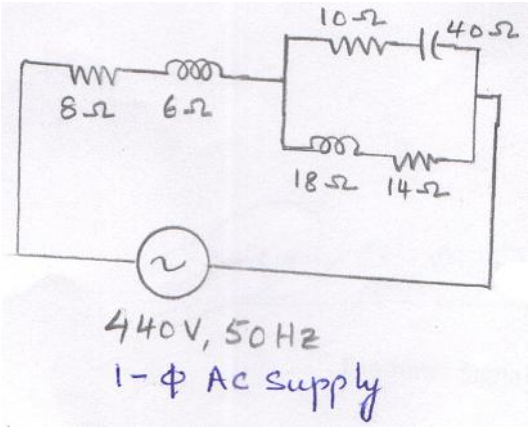
1 State Krichhoff's voltage law. (2)
2 Define form factor. (2)
3 What do you understand by active power? (2)
4 Give the purpose of open circuit test on a transformer. (2)
5 Draw the vector diagram for phase voltages and currents in a three phase star connection. (2)
6 What are the three most important characteristics of a DC generator? (2)
7 What is the working principle of a dc motor? (2)
8 Draw the torque slip characteristics of a three phase induction motor. (2)
9 What is a fuse? (2)
10 Mention a few applications of a single phase induction motor. (2)

PART – B (50 Marks)

11 (a) State and explain Thevenin's theorem. (5)
(b) Using Thevenin's theorem find the current in the 20Ω resistor. (5)



12 Determine the current drawn by the series parallel circuit shown and find the overall power factor. (10)



13 Three impedances, each of resistance 10Ω and inductive reactance of 5Ω in series, are connected in (10)
(a) Star and (b) Delta across a three phase, 400 V AC supply.
Find the line currents and the total power in each case.

14 (a) What are the different types of losses in a transformer? (4)
(b) Draw the circuit diagram for open circuit test and briefly explain how the test is carried out. (6)

15 (a) An 8-pole dc generator has 96 slots and 16 conductors per slot. The flux per pole is 40 mWb and the speed is 960 rpm. Find the emf produced if the machine is (a) lap wound (b) wave wound. (5)
(b) Describe in detail the methods of speed control of a dc shunt motor. (5)

16 (a) Briefly explain the principle of operation of a three phase induction motor. (5)
(b) Draw the schematic diagram of a capacitor start, capacitor run single phase induction motor. (5)

17 (a) Explain how static capacitor are used for power factor improvement. (5)
(b) What is the purpose of earthing in electrical networks? Mention a few conventional methods of earthing. (5)

*****