Code No. 5021 / O

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I – Semester (Old) Examination, December 2015

Subject: Strength of Materials – I

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

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

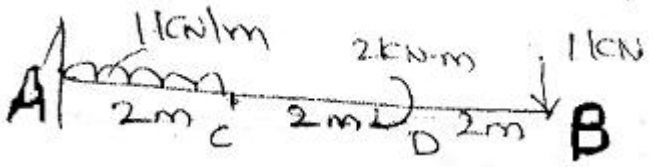
PART – A (25 Marks)

1 Define Ductility and Brittleness. 3

2 Derive the expression to determine the deformation of bar due to self weight. 2

3 Derive relationship between Elastic Modulus and Bulk Modulus. 3

4 Draw the B.M. diagram for beam given below. 3



5 A rectangular beam of cross-section 400 x 600 mm (Width x Depth) has a maximum bending stress of 80 MPa. The beam is simply supported over a span of 5 m. Determine the central point load the beam carries. 3

6 A beam having rectangular cross section 250 x 500 mm is subjected to a S.F of 8 kN. Calculate maximum and average shear stress. 3

7 What are zero force members? Why are they provided? 2

8 A thin cylinder of 1.2m diameter having thickness of 20 mm is subjected to hoop stress of 15 N/mm^2. Find internal pressure and longitudinal stress. 2

9 Determine the core of circular section. 2

10 How is a force polygon constructed? Explain. 2

PART – B (50 Marks)

11 A compound bar is made of fastening one flat bar of steel between two similar bars of aluminium alloy. The dimensions of each bar are 40 mm wide x 8 mm thick, so that the cross-section of the composite bar measures 40 mm x 24 mm. If $E_s = 2.04 \times 10^5$ N/mm^2 and $E_{alloy} = 0.612 \times 10^5$ N/mm^2, find the elongation of bar.

12 A bar 30 mm in diameter was subjected to a tensile load of 54 kN and the measured extension on 300 mm gauge length was 0.112 mm and change in diameter was 0.00366 mm. Calculate Poisson's ratio and value of three modulli.

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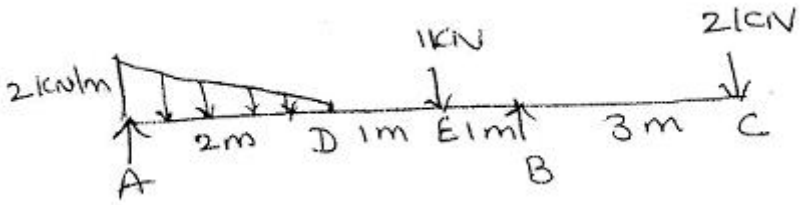
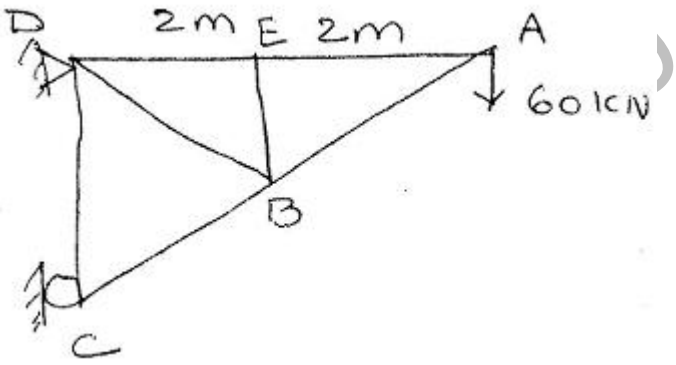
13 Draw the S.F. and B.M. diagram and evaluate salient features if any



14 Determine the forces in the members of the truss by method of joints.



15 Compare the weights of two beams of the same material and of equal strength, one being circular section and solid and the other being of hollow circular section. The internal diameter being 3/4 of the external diameter.

16 A 300 mm x 150 mm I-girder has 12 mm thick flanges and 8 mm thick web. It is subjected to a shear force of 150 kN at a particular section. Find the ratio of maximum shear stress to minimum shear stress in the web. What is the maximum shear stress in the flange?

17 A compound thick cylinder is formed by shrinking a tube of external diameter 300 mm over another tube of internal diameter 150 mm. After shrinking the diameter at junction of the tube is found to be 250 mm and radial compression as 28 N/mm^2. Find the original difference in radii at the junction. Take $E = 2 \times 10^5$ N/mm^2.

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Code No. 5054 / N

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I – Semester (New) (Main) Examination, December 2015

Subject: Strength of Materials – I

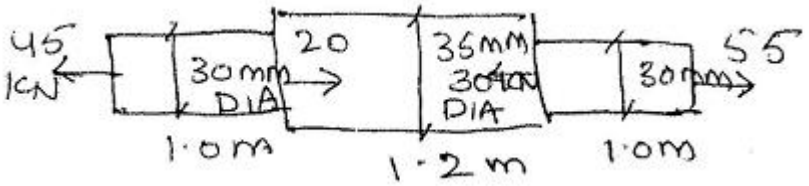
Time: 3 Hours **Max.Marks: 75**

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

PART – A (25 Marks)

1 Define ductility and malleability. 3

2 A steel bar of variable section is subjected to forces as shown in Fig. Taking E = 205 kN/m^2. Determine the total elongation of the bar. 3

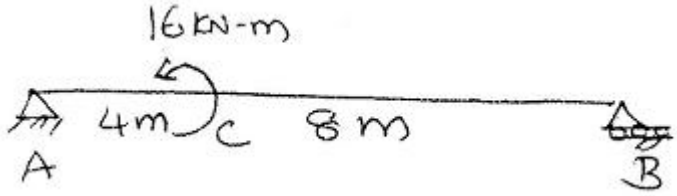


3 If two pieces of material A and B have the same bulk modulus, but the value of E for B is 1% greater than that for A. Find the value of N for the material B in terms of E and N of material A. 3

4 A piece of material is subjected to tensile stresses of 70 N/mm^2 and 50 N/mm^2 at right angles to each other. Find fully the stresses on a plane the normal of which makes an angle of 35^o with the 70 N/mm^2 stress. 2

5 Draw Mohr circle when $\pm_x = (-\pm_y)$ and $\sigma_x = \sigma_y$ (where σ_x and σ_y are stress acting on planes perpendicular to each other). 2

6 Draw SF and BM diagram for simply supported beam as shown in Figure. 2



7 A beam 500 mm deep of a symmetrical section has I = 1x10^8 mm^4 and is simply supported over a span 10 metres. Calculate (a) the uniformly distributed load it may carry if the maximum bending stress is not to exceed 150 N/mm^2. 3

8 If the average shear stress of a circular section is 4.0 N/mm^2. Calculate diameter of the section if the shear force on the section is 10 kN. 2

9 A solid shaft of 250 mm diameter has the same cross sectional area as the hollow shaft of same material with inside diameter of 200 mm. find the ratio of power transmitted by the two shafts for the same angular velocity. 3

10 A pipe of internal diameter 150 mm and 4 mm thick is made of mild steel having a tensile yield stress of 380 N/mm^2. Determine the maximum permissible internal pressure if the stress factor on the maximum shear stress is to be 4. 2

PART – B (50 Marks)

11 A steel bar is sand wiched between two copper bars each having the same area and length as the steel bar, at an initial temperature of 10^{o}C. These are rigidly connected together at both the ends. When the temperature is raised to 260^{o}C the length of the bars increases by 1.0 mm. Determine the original length and final stress in bar. Take E_S = 2.0 x 10^5 N/mm^2, E_C = 1 x 10^5 N/mm^2, $\sim_s$ = 12 x 10^{-6} / ^{o}C, $\sim_c$ = 18 x 10^{-6} / ^{o}C.

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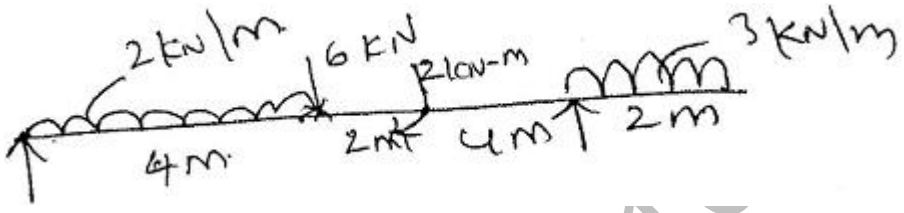
12 Determine the percentage change in volume of a steel bar 50 mm square in section 1 m long when subjected to an axial compressive load of 20 kN. What change in volume would a 100 mm cube of steel suffer at a depth of 5 km in a sea water.

13 An element in plane stress is subjected to stresses p_1 = 120 N/mm^2, p_2 = 45 N/mm^2 (both tensile) and shearing stress of 30 N/mm^2. Determine the stresses acting on an element rotated through an angle $^-$ = 45^{o}C.

14 Draw the S.F and B.M. diagram for the beam shown in figure. Mark the salient features if any.



15 A beam AB of 4 m span is loaded with a central point load of 60 kN. The section of the beam is a rectangle 150 mm wide and 300 mm deep. At a cross-section distant 2 m from support, calculate bending and shear stress at a distance of 40 mm from neutral axis.

16 A solid shaft of mild steel 240 mm dia is to be replaced by a hollow shaft of alloy steel for which allowable shear stress is 22 percent greater. The power to be transmitted is to be increased by 20% and the speed of rotation increased by 5%. Determine the maximum internal diameter of the hallow shaft.

17 A compound cylinder formed by shrinking one tube on to another is subjected to an internal pressure of 50 N/mm^2. Before the fluid is admitted, the internal and external diameters of the compound cylinder are 100 mm and 180 mm and the diameter at the function is 150 mm. If after shrinking on, the radial pressure at the common the surface is 8 N/mm^2. Calculate the final stress set up by the section.

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Code No. 5026 / O

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) I – Semester (Old) Examination, December 2015

Subject : Principles of Mechanical Engineering

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

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

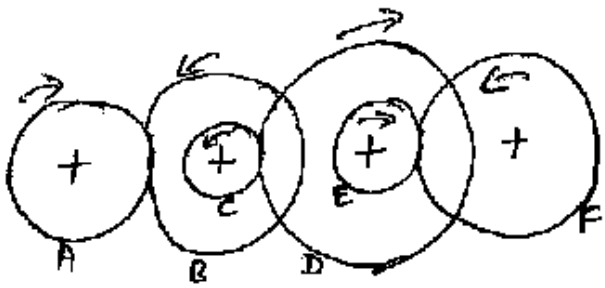
PART – A (25 Marks)

1	Explain the three modes of heat transfer.	3
2	Apply steady flow energy equation for a nozzle.	2
3	Describe heating and humidification and show it on psychrometric chart.	3
4	Write the properties of a refrigerant.	3
5	What is Bore and stroke in an IC engine.	2
6	Draw P-V and T-S diagram for a closed cycle Gas turbine.	2
7	What is priming?	2
8	What is the speed ratio and train value of a gear train?	2
9	What is the power transmitted by a belt?	3
10	Explain the terms gross head, net head and efficiency of turbine.	3

PART – B (50 Marks)

11	a)	Obtain heat conduction equation for a hollow cylinder.	5
	b)	A small electric heating application uses wire of 2mm diameter with 0.8mm thick insulation (K = 0.12 W/mc^0). The heat transfer coefficient (h_o) on the insulated surface is 35 W/m^{2}C^0. Determine the critical thickness of insulation and the percentage change in the heat transfer rate if the critical thickness is used.	5
12	a)	Explain Hancashire boiler with neat sketch.	5
	b)	A large 4-stroke cycle diesel engine runs at 2000 rpm. The engine has a displacement of 25 lts and a brake mean effective pressure of 0.6 MN/m^2. It consumes 0.018 Kg/sec of fuel (calorific value = 42,000 KT/Kg). Determine the brake power and brake thermal efficiency.	
13	a)	Obtain the length of an open belt drive.	5
	b)	The gearing of a machine tool is shown in fig. The motor shaft is connected to gear 'A' and rotates at 975 rpm. The gear wheels B,C,D and E are fined to parallel shafts rotating together. The final gear F is fined on the output shaft. What is the speed of gear F? The number of teeth on each gear are as given below.	5

Gear	A	B	C	D	E	F
Number of teeth	20	50	25	75	26	65



14 a) What are characteristic curves of a turbine? Explain in detail. 5
b) Derive an expression for Hagen Poiseuinille's formula. 5

15 a) Explain the working of reciprocating pump. 5
b) What is the effect of acceleration in suction and delivery pipe? 5

16 a) A single stage reciprocating air compressor takes in 7.5 m^3/m of air at 1 bar and 30^0c and delivers it at 5 bar. The clearance is 5% of the stroke the expansion and compression are polytropic, n = 1.3 calculate the temperature of delivered air, volumetric efficiency and power of the compressor 5
b) The flow rates of hot and cold water streams running through a parallel-flow heat exchanger are 0.2 Kg/sec and 0.5 Kg/sec respectively. The inlet temperature on the hot and cold sides are 75^0C and 20^0C respectively. The exit temperature of hot water is 45^0C. If the overall heat transfer coefficient is 325 W/m^2C^0. calculate the area of the heat exchanger. 5

17 a) Explain air refrigeration system with sketch. 5
b) What are the methods to improve thermal efficiency of a gas turbine? 5

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Code No. 5060 / N

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) I - Semester (New)(Main) Examination, December 2015

Subject : Principles of Mechanical Engineering

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

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

PART – A (25 Marks)

1 State the differences between refrigerator and a heat pump.
2 A hot plat 1 mt x 1.5 mt is maintained at 300^{o}C. Air at 25^{o}C blows over the the plate. If the connective heat transfer coefficient is 20 w/m^{2} ^{o}C. Calculate the rate of heat transfer.
3 Enumerate the factors which should be considered while selecting a boiler.
4 Define Reynolds number and state its significance.
5 State the merits of gas turbines over I.C. engines.
6 What is priming? Why is it necessary?
7 Explain the terms creep and slip associated with belt drives.
8 Differentiate between the turbines and pumps.
9 What is draft tube? Why is it used in a reaction turbine?
10 Write the differences between centrifugal and reciprocating pumps.

PART – B (50 Marks)

11 (a) Write down the steady flow energy equation for a turbine.
(b) Derive an expression for LMTD of parallel flow heat exchangers.

12 (a) Explain Locomotive boiler with a neat sketch.
(b) A two stroke internal combustion engine has a mean effective pressure of 6 bars. The speed of the engine is 1000 r.p.m. If the diameter of piston and stroke are 110 mm and 140 mm respectively, find the indicated power developed.

13 (a) Give the expression for power transmitted by a belt? When is this power maximum?
(b) Discuss about various types of gear trains in detail.

14 (a) State and derive Bernoulli's equation.
(b) What is specific speed? State its significance in the study of hydraulic machines.

15 (a) Explain the working of a single stage centrifugal pump with a neat sketch.
(b) Explain the function of air vessels in a reciprocating pump.

16 (a) A single acting reciprocating pump running at 30 r.p.m. delivers 0.012 m^{3}/s of water. The diameter of the piston is 250 mm and stroke length is 500 mm. Determine the theoretical discharge and coefficient of discharge.
(b) List the advantages and drawbacks of a four stroke engine over a two stroke engine.

17 Write short notes on the following:
(a) Properties of refrigerants
(b) Concept of multistage compression
(c) Problems faced in pumps

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Code No. 5029 / O

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) I – Semester (Old) Examination, December 2015

Subject: Elements of Production Techniques

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 What is meant by manufacturing processes? Give the broad classification of manufacturing processes.
2 Explain the procedure to make sand moulds.
3 What is meant by weldability? Mention the factors on which weldability depends.
4 Name the different flames used in oxyacetylene gas welding and describe how are these obtained.
5 Define the following terms used in lathe machine operation:
   i) Cutting speed ii) Feed
   iii) Depth of cut iv) Machining time
6 Explain the concept of FMS.
7 Write the applications and benefits of unconventional machining processes.
8 Write the principle of electrical discharge machining.
9 Write the classification of forming processes.
10 Write the applications of rolling process.

PART – B (50 Marks)

11 a) Write the classification of moulding processes.
   b) Write the functions of a pattern and explain the desirable properties of a pattern materials.

12 a) What do you understand by gas welding and how it is different from brazing and soldering.
   b) Describe electric resistance welding.

13 a) Explain the working principle of milling process.
   b) Write the advantages and limitations of NC and CNC machines.

14 a) Explain the ultrasonic machining process.
   b) Explain the electrical discharge machining process.

15 a) What is powder metallurgy? What are the various methods of manufacture of metal powders?
   b) Define forging. What are the advantages of the forging of metals?

16 a) Describe the quick return mechanism used on shaper.
   b) Explain the die-casting machining process.

17 Write short notes on:
   i) Abrasive jet machining process
   ii) Welding fluxes
   iii) Laser beam machining.

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Code No. 5062 / N

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) I - Semester (New)(Main) Examination, December 2015

Subject : Elements of Production Techniques

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

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

PART – A (25 Marks)

1 What are the properties of core material?
2 Define manufacturing.
3 What is flux? Explain its importance.
4 What are the types of resistance welding process?
5 List out the advantages and limitations of CNC machining.
6 A milling cutter having 8 teeth is rotating at 150 rpm. If the feed per tooth is 0.1. What is the table speed in mm/min?
7 What is the principle of material removal is USM?
8 List out advantages and limitations of EDM.
9 Why gutter provided in forging?
10 What are the methods of powder production?

PART – B (50 Marks)

11 (a) Explain the various pattern allowances in casting.
(b) What are the merits and limitations of manufacturing process?

12 (a) Difference between submerged arc welding and electro-slag welding explain with neat sketches.
(b) Explain gas welding types of flames.

13 (a) What are the basic elements of FMS?
(b) What are the differences among NC, CNC and DNC?

14 (a) Explain abrasive jet machining.
(b) What are the advantages and application of USM?

15 (a) Explain why forged parts are stronger than cast products.
(b) Classify various forming processes with examples.

16 (a) Differentiate between consumable and non-consumable electrodes.
(b) Write the applications and limitations of casting.

17 Write short notes on the following:
(a) FMS
(b) Resistance welding
(c) Deep drawing

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Code No. 5033 / O

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (Old) Examination, December 2015

Subject : Elements of Mechanical Engineering

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 What do you mean by clausius inequality?
2 Distinguish petrol and diesel engines.
3 What is Stefan-Boltzman law of radiation?
4 Distinguish parallel and counter-flow heat exchangers.
5 What are the properties of refrigerants?
6 What is wet bulb temperature? How is it measured?
7 Distinguish welding brazing and soldering.
8 Why are allowances required on patterns? Name the different types of pattern allowances.
9 What are compound gear trains?
10 Define kinematic pair.

PART – B (5 x 10 = 50 Marks)

11 a) Distinguish between 4-stroke and 2-stroke cycles in I.C. engine. 4
b) Two engines are to operator on Otto and Diesel cycle on the following data : 6
Maximum temperature = 1227^0C
Exhaust temperature = 427^0C
Ambient conditions = 1 ata and 27^0C
Find the compression ratios, maximum pressure and efficiencies.

12 a) State the Fourier's law of conduction.
Calculate the rate of heat loss for a red brick wall of length 5m, height 4 m and thickness 0.25m. The temperature of the inner surface is 110^0C and that of the outer surface is 40^0C. The thermal conductivity of red brick, k = 0.70 W/mK. Calculate also the temperature of an interior point of the wall, 20 cm diameter from the inner wall. 2+2

b) In a double pipe counter flows heat exchanger, 10,000 kg/h of oil having a specific heat of 2095 J/kg K is cooled from 80^0C to 50^0C by 8,000 kg/h of water entering at 25^0C. Determine the heat exchanger area for an overall heat transfer coefficient of 300 W/m^{2}K. Take Cp for water as 4180 J/kgK. 6

13 a) With the help of a diagram, explain the working of ammonia-water absorption refrigeration system. 7
b) Define psychorometry and explain various psychrometry processes. 3

..2

14 a) Describe the working principle of gas welding and arc welding and also its process parameters. 6

b) Sketch and explain the various types of drawing processes. 4

15 a) Derive the condition for maximum power transmission for flat belt drive. 5

b) Sketch and explain the working principle of an epi-cyclic gear train. 5

16 a) State the Zeroth law of thermodynamics. What is its importance? 3

b) 60 lit. of gas at 20^0C and 1.03 bar is compressed adiabatically to 9.8 bar. It is then cooled at constant volume to pressure P^3 and further expanded isothermal so as to reach the initial condition. Find i) the value of pressure, P^3 ii) the arithmetical difference between the work done in adiabetic compression and isothermal expansion and, iii) the change in internal energy in constant volume process, assume Cp = 14.28 and Cv = 10.13 kJ/kg.K. 7

17 Write a short notes on any four of the following : 10

i) Multi-stage air compressor
ii) Eco-friendly refrigerants
iii) Extrusion process
iv) Mechanism
v) Inverted gear trains

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Code No. 5065 / N

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (New) (Main) Examination, December 2015

Subject: Elements of Mechanical Engineering

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 State zeroth law of thermodynamics and explain its importance
2 Define Isothermal and volumetric efficiency of air compressor
3 Write applications of heat exchangers
4 State Stefan-Boltzman law of radiation
5 Explain the working of Thermo electric refrigeration system
6 Sketch vapor compression refrigeration cycle on P-h and T-s plane
7 List various equipment used in arc welding system
8 What are the functions of a lathe machine?
9 Derive the expression for the length of a cross belt
10 What is the difference between simple gear train and compound gear train?

PART – B (50 Marks)

11 a) Describe the working of two stroke petrol engine with appropriate sketches 5
b) Apply steady flow energy equation to the following and simplify. (2.5+2.5)
i) Nozzle ii) Boiler

12 a) A brick wall (K=0.625 W/mk) is 0.5 m thick. If the temperature of the inner and outer surfaces are maintained at 100°C and 40°C respectively. Determine the heat loss per unit area. Find also the temperature at an interior point of the wall 0.2m distance from the outer surface. Sketch the temperature distribution of this wall. 7
b) Describe various modes of heat transfer. 3

13 a) An air refrigeration system working on Bell-Coleman cycle draws air from the cold chamber at -5°C and 1 bar. The air is compressed to 10 bar and then cooled to 30°C before sent to the expansion cylinder. If compression and expansion are isentropic find COP of the system and refrigeration effect for a mass flow rate of air 1.2 kg/sec. 5
b) Describe the working of Vapor compression refrigeration system with a line diagram.

14 a) Describe the three types of flames used in gas welding and give their field of applications. 5
b) Explain : (2.5+2.5)
i) Wire drawing process ii) Basic rolling process

15 a) Explain the slider crank mechanism with a sketch. 3
b) An open belt drive is transmitting 25kW of power. The pulleys are 600mm diameter and 800mm diameters and placed at 2 m apart. The speed of smaller pulley is 600rpm. Find the Tensions ratio of the belt drive. Take coefficient of friction as 0.25 and neglect the effect of centrifugal tension. 7

16 a) Describe the working of a two stage air compressor with a neat sketch with perfect inter cooler. 5
b) Classify the grinding machines and mention their applications. 5

17 Write short notes on ***any two*** of the following: 5+5
a) Eco friendly refrigerants
b) Working of shaping machine
c) Epicyclic gear train

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Code No. 5038 / O

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/AE) I – Semester (Old) Examination, December 2015

Subject : Managerial Economics and Accountancy

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 discounting principle.	3
2	How demand forecasting helps in decision making?	2
3	What is scarcity defination of economics?	2
4	Explain what is meant by Monopoly.	2
5	Write about profit-volume ratio.	2
6	Define pay back method.	3
7	Explain subsidiary books.	2
8	Write about types of cash book.	3
9	Marginal cost Vs Average cost.	3
10	What are the components of working capital?	3

PART – B (5 x 10 = 50 Marks)

11 Discuss the fundamental concepts of managerial economics.

12 How price and output is determined under perfect competition?

13 Explain the law of returns.

14 State the assumptions in Break-even analysis. Explain how break-even analysis is used by the managers in their day-to-day operations?

15 Explain the concepts and conventions of accountancy.

16 From the following details of XYZ project, suggest whether to accept the projector reject by using a) pay back method b) NPV method

Initial cash inflow = 20,000
No. of years = 5 years
Discount rate = 10%

Year	Annual cash inflow (Rs).
1	8,000
2	12,000
3	9,000
4	7,000
5	6,000

..2

17 Prepare final accounts from the following :

Particulars	Rs.	Particulars	Rs.
Opening stock	1250	Plant and Machinery	6230
Sales	11800	Return outwards	1380
Depreciation	667	Cash in hand	835
Commission (credit)	211	Salaries	750
Insurance	380	Debtors	1905
Carriage inwards	300	Discount (debit)	328
Furniture	670	Bill receivable	2730
Printing charges	481	Wages	1589
Carriage outwards	200	Return inwards	1659
Capital	9228	Bank overdraft	4000
Creditors	1780	Purchases	8679
Bills Payable	541	Petty cash in hand	47
		Bad debts	180

Closing stock on 31st December 2005 was Rs.3,700/-.

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Code No. 5071 / N

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/A.E) I – Semester (New) (Main) Examination, December 2015

Subject: Managerial Economics and Accountancy

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	Evolution of Economics – Explain.	2
2	Explain opportunity cost principle.	2
3	What is demand schedule?	2
4	Law of diminishing marginal utility.	2
5	Define production function.	2
6	What is journal and ledger?	3
7	What are subsidiary books?	3
8	Firm demand and Industry demand.	3
9	Sources of working capital.	3
10	Write journal entries for the following transactions: a) Deepak commenced business with Rs. 50,000 b) Sold goods for cash Rs. 5,000 c) Paid rent to landlord Rs.2,000	3

PART – B (50 MARKS)

11 Define Managerial Economics and write about the usefulness of managerial economics to Engineers.

12 Economies of scale – Internal Economies and External Economies Explain

13 What is Perfect market? Explain the main features of perfect market.

14 The following data is extracted from ABC Co. Ltd.

Sales Rs.10,00,000 Variable cost Rs.5,00,000 Fixed cost Rs. 3,00,000

Calculate: a) P/V Ratio b) Break-even point (in sales value)
c) Margin of safety d) Margin of safety ratio.

15 Modern Co. Ltd. Is proposing to take up a project at an investment of Rs.40,000, the net income before depreciation and tax is as follows

Year	1	2	3	4	5
Rs.	10,000	12,000	14,000	16,000	20,000

Depreciation is to be charged on straight line method, tax rate 50%. Calculate Accounting Rate of Return.

16 Prepare a bank reconciliation statement of M/s.Hussain & Co. as on 31-03-2010.
a) Bank balance as per cash book Rs. 12,500
b) Cheque paid into bank but not credited Rs.1600
c) Cheque issued but not presented for payment Rs.900
d) Interest on fixed deposit collected and credited in pass book Rs.1200
e) Bank charges debited in pass book Rs. 50

..2

17 From the following particulars prepare trading and profit and loss account for the year ending 31-12-2006 and balance sheet as on date

TRIAL BALANCE

Particulars	Debit Rs.	Credit Rs.
Sales		1,28,000
Duty and clearing charges	3,500	
Purchases	50,000	
Bank overdraft		6,000
Capital		30,000
Sundry creditors		43,000
Drawings	6,000	
Bills payable		4,000
Sundry debtors	51,000	
Bills receivable	8,000	
Loan given to vijay & co.	10,000	
Fixtures & fittings	7,500	
Opening stock	47,000	
Cash in hand	900	
Machinery	12,500	
Commission received		4,000
Salaries	9,500	
Sales returns	1,000	
Purchase returns		1,100
Commission & travelling expenses	4,700	
General expenses	2,500	
Rent paid	2,000	
Total RS.	2,16,100	2,16,100

Adjustments:

1) Closing stock Rs.60,000
2) Outstanding salaries Rs.300 Rent Rs. 400
3) Depreciate plant and machinery by 10% Fixtures and fittings by 5%
4) Commission received in advance Rs. 500
5) Allow interest on capital at 8% P.A.

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Code No. 5044 / O

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I – Semester (Old) Examination, December 2015

Subject : Basic Electronics

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 forward static and dynamic resistances of diode.	2
2	What is the hall effect in semiconductor?	3
3	What are the differences between rectifier and regulator?	2
4	Why transistor cannot be replaced by back to back diode connection?	3
5	Draw the small signal model for a common-source PET configuration.	2
6	What are the disadvantages of negative feedback and prove them?	3
7	What are the main differences between an amplifier and oscillator?	2
8	What are the different stages of OP-Amp?	3
9	What are logic gates? What are the different types of logic gates?	2
10	Give the symbol and simplified equivalent circuit of UJT.	3

PART – B (50 Marks)

11	a)	What is an ideal diode? How can it represented as a switch? Draw the equivalent circuit and its characteristics?	5
	b)	With neat circuit diagrams explain the operation of bridge full wave rectifier, and sketch the wave forms.	5
12	a)	Explain the input and output characteristics of the transistor in CE configuration with diagrams.	5
	b)	Sketch and explain the operation of CD-amplifier derive the expression for the voltage gain at mid frequencies.	5
13	a)	An amplifier has an open loop voltage gain 1000 $\pm$ 100. If 10% of negative feedback is introduced what will be it close loop voltage gain and its variation?	3
	b)	Explain the principle of operation of Hartley oscillator with neat circuit diagram. Derive the frequency of oscillations and condition to get sustain oscillations.	7
14	a)	Draw the inverting and non-inverting amplifier circuits of OP-Amp in closed-loop conjugation. Obtain the expressions for the closed-loop gain in these circuits.	6
	b)	What is the difference between input offset current and input bias current?	4
15	a)	What is a half subtracter? Realise a full subtracter using NAND gate only.	5
	b)	List the five physical quantities that the transducer measures. Explain the operating principle of an LVDT.	5
16	a)	What is the difference between CRT and CRO? Draw a neat block diagram of a general purpose CRO and explain function of each block.	7
	b)	Explain the operation of simple inventon circuit.	3
17	a)	Write short notes on : a) DIAC b) Zenen voltage regulator and c) LED	10

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CODE NO: 5077 / N

FACULTY OF ENGINEERING

B.E 2/4 (CSE) I – Semester (New) (Main) Examination, December 2015

Subject: Basic Electronics

TIME: 3 Hour **Max. Marks: 75**

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

Part – A (25 Marks)

1 The reverse saturation current I_o in a germanium diode is 6 «A .Calculate the current flowing through the diode when applied forward bias voltage is 0.2V at room temperature (2)

2 Define diffusion current and drift current in a semiconductor. (3)

3 In FET, define transconductance (g_m) and amplification factor («) (2)

4 Explain early effect (3)

5 An amplifier has an open loop gain of 300. When negative feedback is applied, the gain is reduced to 240. Find the feedback ratio. (3)

6 Explain why LC oscillators are not used to generate low frequency oscillations. (2)

7 Why an open loop operational amplifier is not suitable for linear applications? (2)

8 Realize the basic logic gates using NAND gates (3)

9 Explain the operation of Photo diode. (3)

10 Write the applications of CRO. (2)

Part – B (50 Marks)

11 a) Draw the circuit diagram of a Centre tapped Full Wave Rectifier and explain its working. Also define and derive the expression for i) ripple factor ii) conversion efficiency iii) TUF, iv) regulation. (7)

b) Define Hall effect and write its applications. (3)

12 a) Compare CB, CE and CC transistor configurations and explain why CE amplifier is most commonly used. (5)

b) Prove that the transconductance g_m in FET is given by $g_m = g_{mo}\left(1-\frac{V_{GS}}{V_P}\right)$. (5)

13 a) Draw the circuit diagram of Colpitts oscillator and explain its working. Also derive the expression for frequency of oscillations. (6)

b) Name the four feedback topologies. Draw their block diagrams. (4)

14 a) Draw the circuit of a differentiator using operational amplifier. Explain its working and derive an expression for its output voltage. (5)

b) Give the truth tables for half adder and full adder and realize both half adder and full adder using NAND gates. (5)

15 a) Draw the block diagram of CRO. Explain the function of each block. (6)

b) What is a transducer? Explain how thermocouple is used for temperature measurement. (4)

16 a) Explain the effect of negative feedback on the input impedance of a voltage-series feedback amplifier. Derive an expression for input impedance with feedback. (5)

b) Explain the working and V-I characteristics of SCR. (5)

17 a) Explain how transistor acts as an amplifier. (4)

b) Distinguish between Zener breakdown and Avalanche breakdown. (3)

c) Explain, with a neat circuit diagram the application of Operational amplifier as an adder (3)

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Code No. 5048 / O

FACULTY OF INFORMATICS

B.E. 2/4 (IT) I – Semester (Old) Examination, December 2015

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 Give ADT for an array. 2

2 Give the mapping functions to calculate location of a given element in a three dimensional matrix using row major representation. 3

3 Differentiate between subtyping and inheritance. 3

4 Define De-Queue. How it is different from linear Queue? 2

5 Define hashing. Why hashing is used? 2

6 What are the advantages of DLL over SLL? 3

7 The preorder traversal of a binary tree is ABCDEFG and its converse inorder is GDFEABC. Construct the tree. 2

8 What is the difference between full finery tree and complete binary tree? Explain with examples. 3

9 Define a heap. What are advantages of heap? 3

10 Give time complexities for the following sorting algorithms. 2
   a) Insertion sort b) Merge sort c) Quick sort d) heap sort

PART – B (50 Marks)

11 a) Derive time complexity for selection sort.

   b) Write C++ function to insert an element into linear list at a given location.

12 a) Write a C++ function to evaluate prefix expression.
   (Hint : consider expression from right to left and place '#' at the left end).
   Exp : - / ∗ A + BCDG

   b) Explain how to solve the problem 1 towers of Hanio using stacks.

13 a) Write an algorithm to delete an element at a given location in singly linked list.

   b) Explain how overflow handling is done in hashing.

14 a) Define graph. Explain DFS and BFS traversals of a graph with examples.

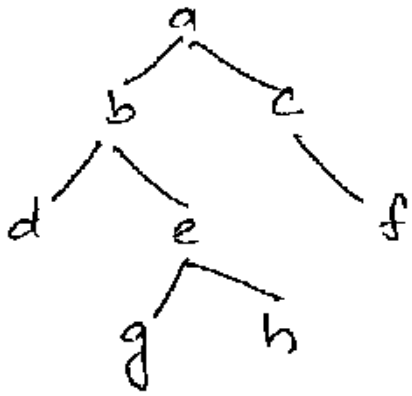
   b) Construct a tree for the following algebraic expression E = (a+b) / ((c-d)∗ e).

15 Explain different rotation operations performed on AVL tree to insert following elements into an initially empty tree.
   15, 6, 25, 11, 10, 13, 3, 29, 37

..2

16 a) Explain merge sort for the following elements.
66, 48, 57, 92, 24, 65, 83, 72

b) Write in order, preorder, post order and level order for the following binary search tree.



17 Write short notes on any of two :
a) Threaded binary tree
b) Secure Hash function
c) Splay trees

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Code No. 5081 / N

FACULTY OF INFORMATICS

B.E. 2/4 (IT) I – Semester (New) (Main) Examination, December 2015

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

1 What is Sparse Matrix? How is sparse matrix represented? (3)
2 Define the terms 'Time Complexity' and 'Space Complexity'. (2)
3 Transform the following expression to prefix and postfix form:
(A+B)∗(C+D-E)∗F (3)
4 Define Circular queues? Give an example. (2)
5 What is Hash function? List few hash functions. (2)
6 What is meant by Linked Stack and Linked Queue? (3)
7 When is an undirected graph said to be 'connected'? (2)
8 State the difference between full binary tree and complete binary tree. (3)
9 Briefly explain merge sort. (3)
10 Define Red Black Tree. (2)

PART – B

11 a) Explain String Abstract Data Type. (5)
b) Determine the frequency count for all statements in the following program segment. Clearly show step count table. (5)

```
int sum(int a[], int n)
{
int s=0;
for(int i=0;i<n;i++)
S+=a[i];
return s;
}
```

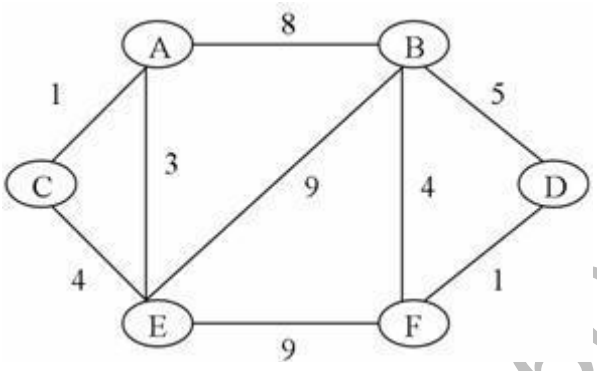
12 a) Write an algorithm for Infix to Postfix Conversion of an expression. Trace the algorithm using any infix expression. (4+3)
b) Write an algorithm to insert an item into Queue data structure. (3)

13 Explain in detail how insertion and deletion operations are performed in singly linked list. (10)

14 a) Make a Binary Search Tree(BST) for the following sequence of numbers: {100, 50, 200, 300, 20, 150, 70, 180, 120, 30}. Traverse the obtained BST in Preorder, Postorder, and Inorder. (3+3)
b) Write about different graph representations. Use Examples (4)

15 a) Write a C++ function to perform Insertion Sort. Trace the algorithm for the elements {12, 2, 16, 30, 8, 28, 4} (3+3)
b) Define Max-Heap. Explain how to insert an element into a Max Heap. (4)

16 What is Minimum Cost Spanning tree (MST)? Explain Prim's algorithm to construct MST and execute prim's algorithm on the following graph. (1+5+4)



17 Write short notes on any 2 of the following: (5+5)

i) Asymptotic notation.
ii) AVL Trees
iii) Heap Sort

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