Code No. 3496

FACULTY OF ENGINEERING

B.E. (Civil/M/P/AE) II – Semester (New) (Main) Examination, June 2017

Subject: Engineering Mechanics – II

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 The height of centre of gravity of a solid hemisphere of radius R from its base circle is _____ R.

2 What do mean by virtual displacement? Explain.

3 Distinguish a rectilinear motion from curvilinear motion of a body.

4 Mention the equations of rotatory motion of a body.

5 Explain the D-Alembert's principle.

6 What is the significance of components of acceleration in general plane motion?

7 State and prove the equation for work energy principle in translation.

8 A bullet fired into a trunk of a tree loses $1/4^{th}$ of its kinetic energy in traveling a distance of 5 cm. At what distance it travels further before it stop.

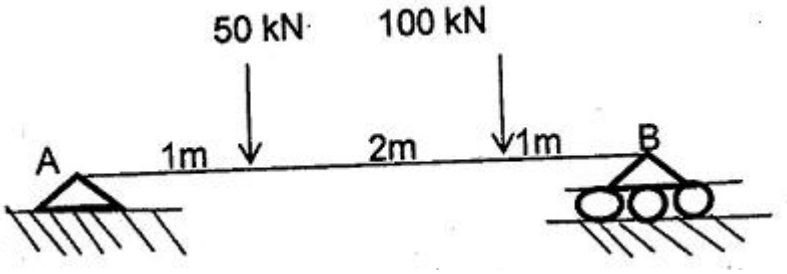
9 State the principle of conservation of linear momentum of a particle.

10 A 5 kg mass moving at a speed of 3 m/s, collides head on with a body of mass 1 kg at rest. If they move with a common velocity after collision in the same direction, what is its final velocity?

PART – B (5x10 = 50 Marks)

11 a) Prove that the center of a gravity for a solid right circular cone of base radius Rand height H is always at H/4 from the base circle. 5

b) Calculate the reactions at A and B of the simply supported beam as shown in Fig. 1 by virtual work principle. 5



12 A ball is thrown down the incline strikes it at a distance 80 m (s) as shown in Fig. 2. If the bass raises to a maximum height 20 m (h) above the point of release, compute its initial velocity and inclination (¯). 10

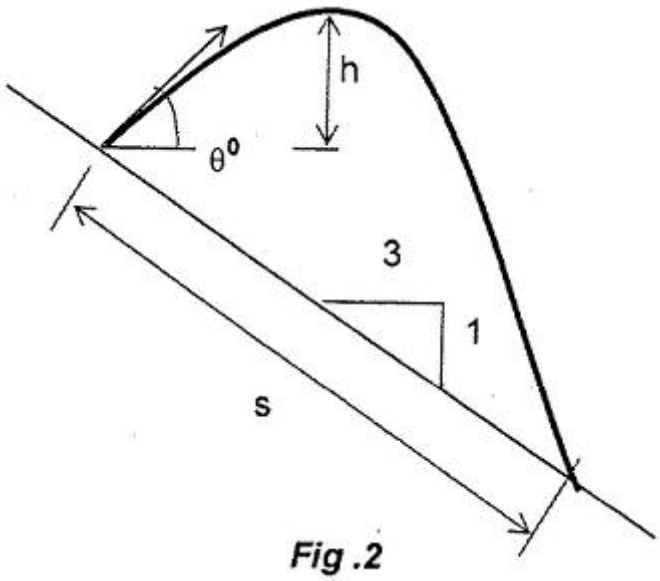


Fig .2

13 Calculate the downward acceleration 'a' of the 10 kg cylinder. The drum is a uniform cylinder and friction at the pivot is negligible. If the drum inertia is ignored, what will be the acceleration? 10

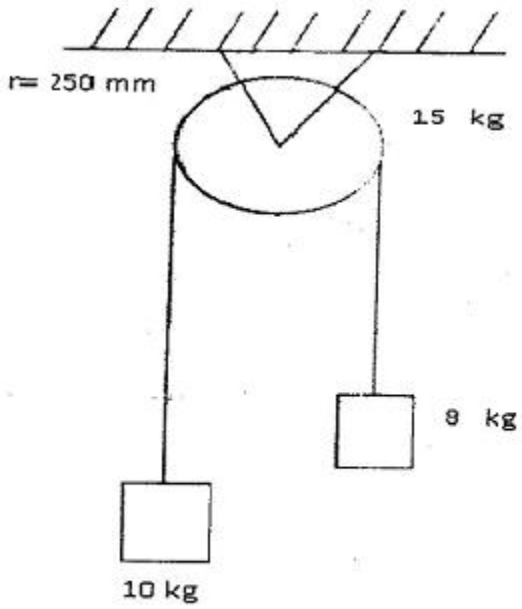


Fig.3

14 The wheel of 1 m radius shown in Fig. 4 rolls freely to the right. At what given position, angular velocity is 4 rad/sec and angular acceleration is 6 rad/sec^2 both clockwise. Compute the velocity and acceleration of point B which is 0.6 m from the centre A of the wheel. 10

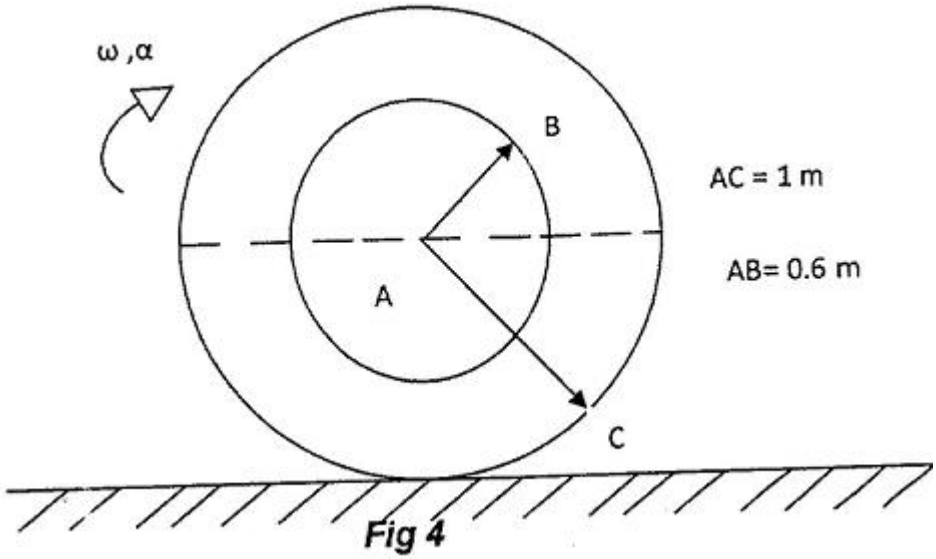


Fig 4

15 The system shown in Fig. 5 is connected by flexible, inextensible cords. If the system starts from rest, find the distance 'd' between A and the ground so that the system comes to rest with body B just touching A, the coefficient of friction between C and the surface is 0.30. 10

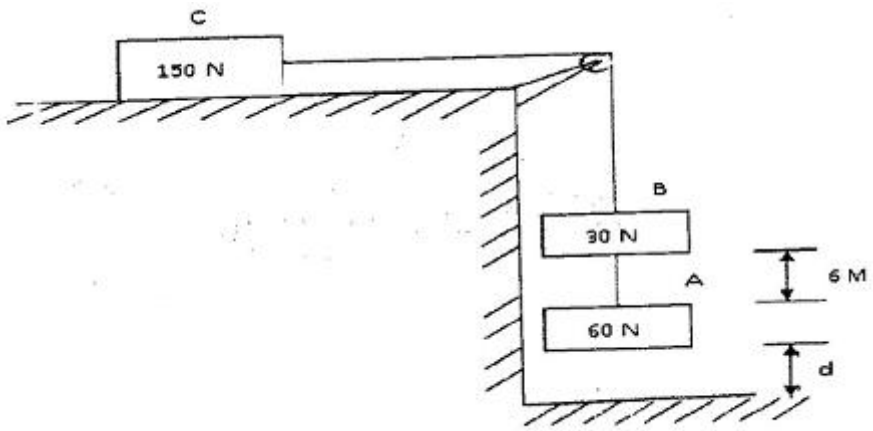


Fig.5

16 A bullet weighing 0.3 N and moving with a velocity 660 mps, penetrates a wooden block of weight 45 N and emerges with a velocity of 180 mps as shown in Fig. 6. How long the block moves? Take the friction between block and ground as 0.40. 10

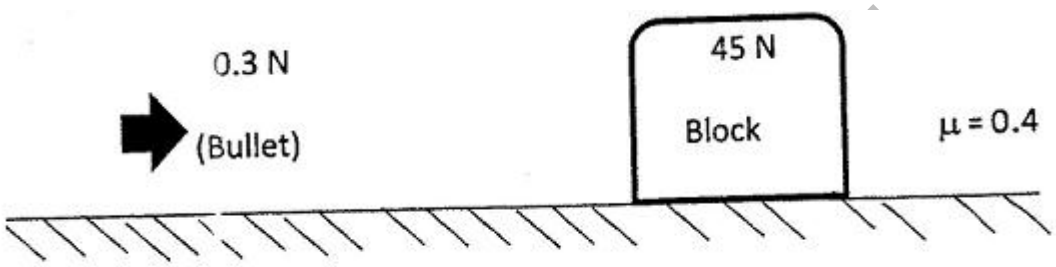


Fig.6

17 Write short notes on the following:

a) Radius of gyration 3

b) Kinematics and kinetics 4

c) Derive the Impulse-Momentum Equation. 3

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Code No. 3497

FACULTY OF ENGINEERING

B.E. (EE/Inst.) II – Semester (Main) Examination, June 2017

Subject: Elements of Mechanical Engineering

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 Define different thermodynamic systems and mention an example in each case.

2 Define entropy and enthalpy.

3 Write the classification and applications of heat exchangers.

4 Define radiation heat transfer and give few practical areas where radiation heat transfer is more effective.

5 State types of refrigerators systems.

6 State the salient features of good refrigerants.

7 Compare arc welding and gas welding.

8 Sketch any one grinding machine and label all the parts.

9 Distinguish between spur gears and helical gears and mention applications of each one.

10 Define creep and slip of a belt.

PART – B (5x10 = 50 Marks)

11 a) 6 kg of air is compressed in a reversible steady flow polytropic process $pv^{1.25}$=const, from 1 bar and 30°C to 10 bar. Calculate the work input and heat transfer. 5

b) Discuss the draw backs of first law of thermodynamics. 5

12 a) Derive the expression for the LMTD of counter flow heat exchanger. 5

b) Determine the heat loss through a wall having K=0.85 W/m K with surface area of 42m^2 and 25cm thickness which separates warm air from cold ambient air. The inner surface of the wall is at 30°C and the outer surface is at -10°C. 5

13 a) Explain the working of vapour compression refrigeration system with neat sketch. What is CoP. 5

b) Plot CoP on cycle on T-¢ and 4-¢ diagram for vapour compression system. 5

14 a) Explain the working of a Die casting machine with a neat sketch. 5

b) Explain the working principle of wire drawing and mention its applications. 5

15 a) Discuss the classification of gear trains. 4

b) A belt drive is designed to transmit power 10kW at a belt speed of 15m/sec. The ratio of belt tensions is 3.5. Calculate:
i) Angle of lap
ii) Belt tensions on tight side and slack side. Consider coefficient of friction as 0.32. 6

16 a) A heat engine produces work 100kW with an efficiency of 35%.Determine the heat transfer rate to and from the working fluid. 5

b) Compare Petrol engines with diesel engines (Write at least five points). 5

17 Write short notes on ***any two*** of the following: 5+5

a) Radiation heat transfer

b) Different belt drives

c) USM.

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Code No. 3499

FACULTY OF ENGINEERING

B.E. (ECE) II – Semester (Main) Examination, June 2017

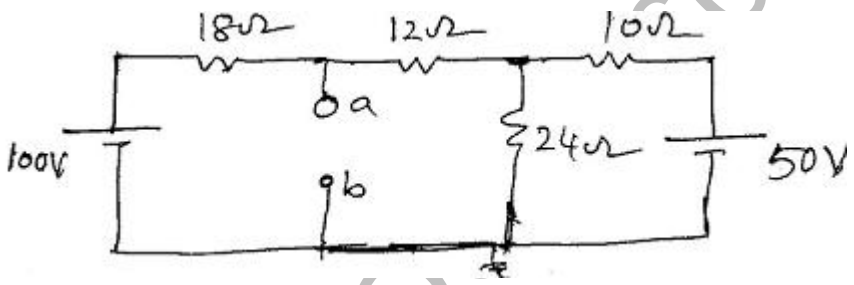
Subject: Basic Circuit Analysis

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 Find V_{ab} in the following circuit. 2

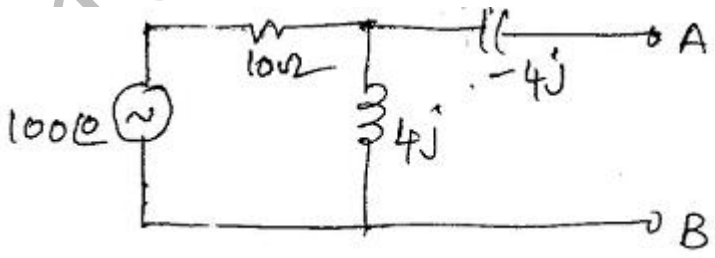


2 Briefly explain magnetically coupled circuit. 2

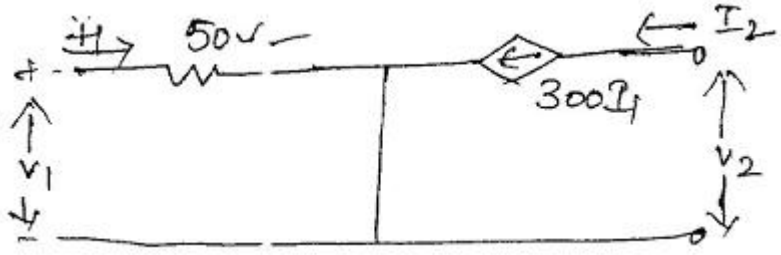
3 State and explain Norton's theorem. 2

4 Define time constant of a RC circuit. 2

5 Find Thevenin's equivalent impedance in the following circuit. 2

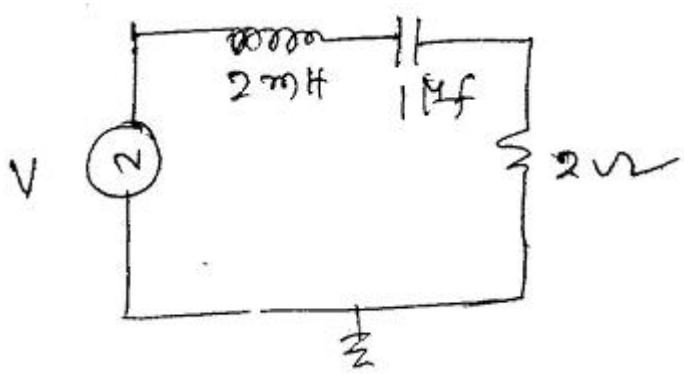


6 Find the h-parameters of the following circuit. 2



7 Derive the condition for reciprocity in terms of Y parameters. 2

8 Find the resonant frequency of the following circuit. 2

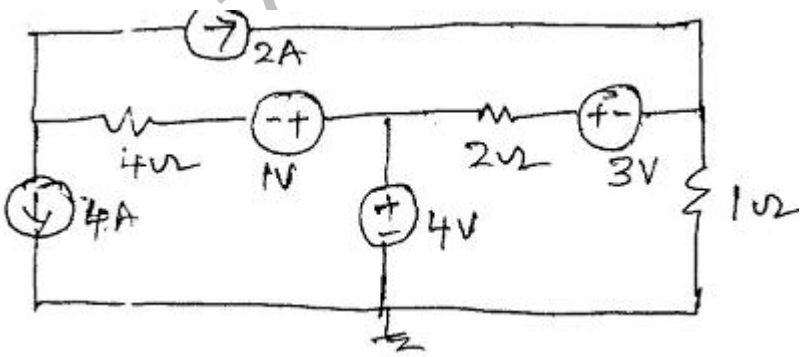


9 Find the initial and final values of the equation $i(t) = 100e^{-100t}$. 2

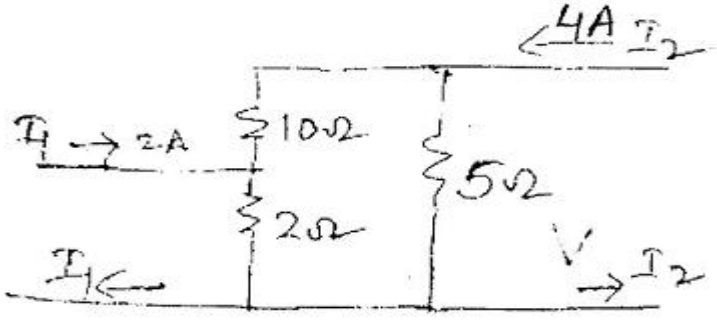
10 Define average power and apparent power. 2

PART – B (5x10 = 50 Marks)

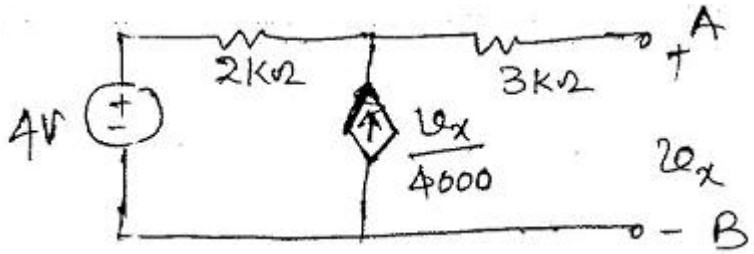
11 a) Find the power supplied by 2A source in the following circuit. 5



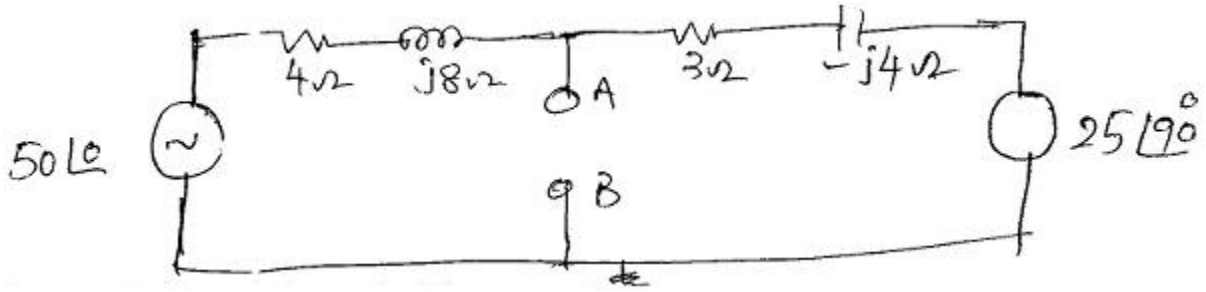
b) Using the super position theorem find the voltage across 2Ω resistor in the following circuit. 5



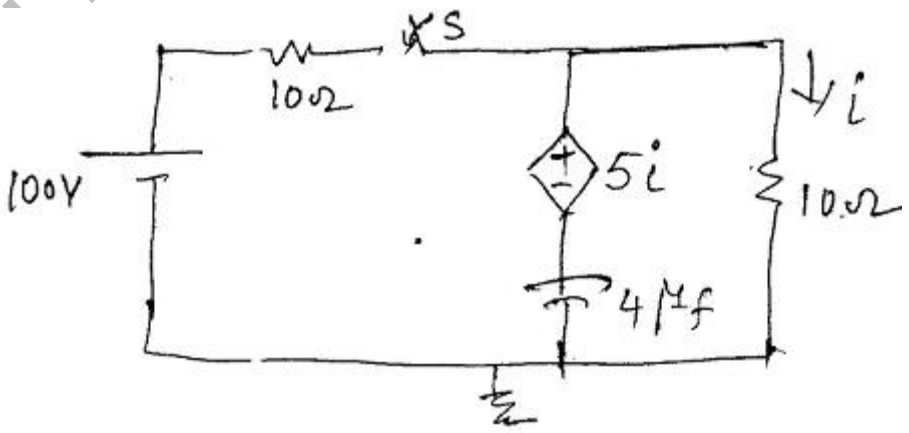
12 a) Find Thevenin's equivalent of the following circuit. 5



b) Find the condition for maximum power transfer in the following circuit and also find maximum power delivered to the load when the load is resistive. 5

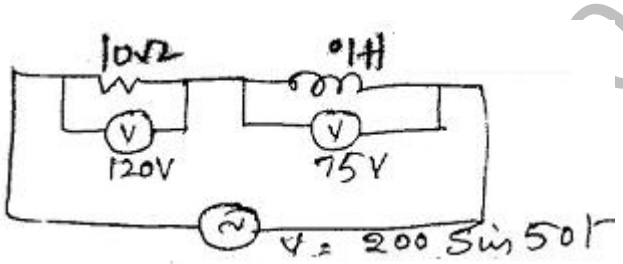


13 a) For the circuit shown below find the current equation i(t) when switch s is opened at t=0. 5

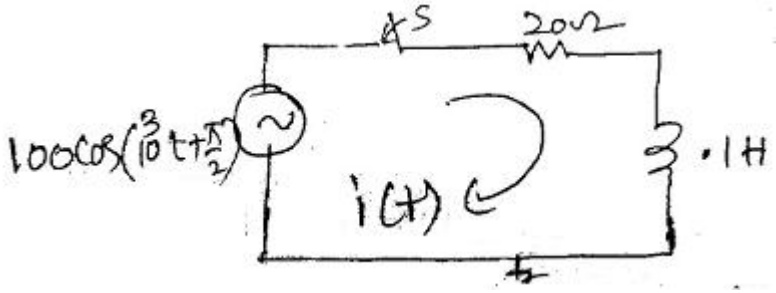


b) Explain about zero input response and zero state response of a circuit. 5

14 a) A Sine wave of V(t) = 200 Sin 50 t is applied to a 10 Ω resistor in series with a coil 0.1 H. The reading of a voltmeter across the resistor is 120 V and across the coil is 75 V. Calculate the active power. 5

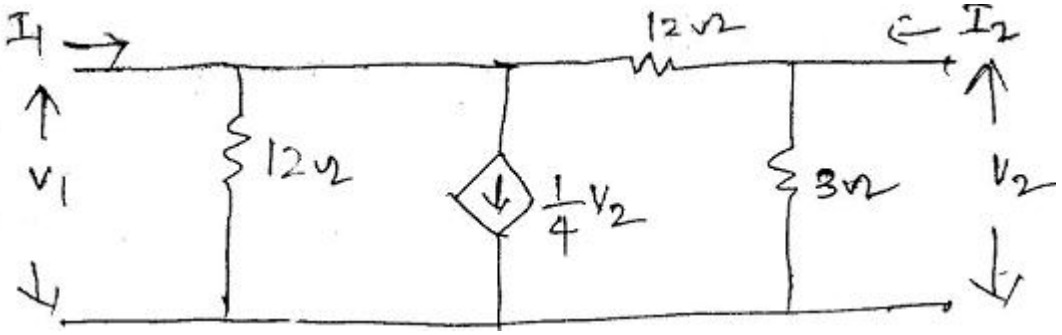


b) In the following circuit determine the complete solution for the current when switch S is closed at t=0, applied voltage V(t) = 100 cos (10^3t + ® /2), R = 20 Ω, L = 1H. 5



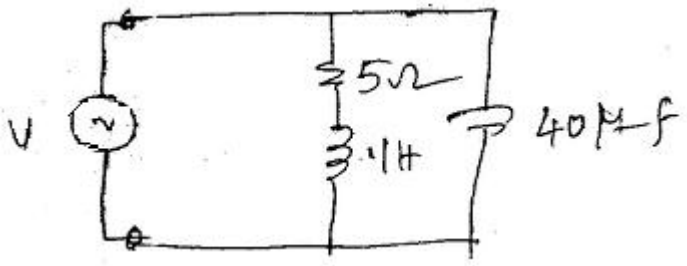
15 a) Derive the relation between ABCD parameters and Y parameters of a Two Port Network. 5

b) Find Y parameters of the following circuit. 5



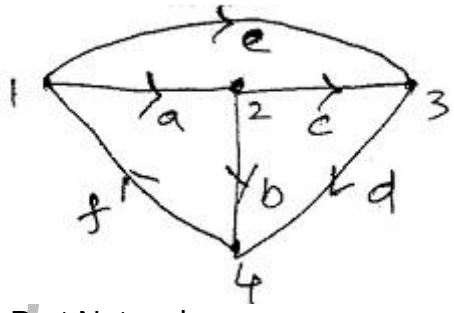
16 a) Derive the relation between Quality Factor and Band Width of a series resonant circuit. 6

b) Find the resonant frequency of the following circuit. 4



17 Answer any two of the following: 10

a) Draw the incidence matrix, tie set matrix of the following graph.



b) Interconnection of Two Port Networks.

c) Draw the pole-zero diagram for the function and hence obtain the Time Domain Response i(t) if $I(s) = \frac{5S}{(s+1)(s+2)}$.

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Code No. 3501

FACULTY OF ENGINEERING & INFORMATICS

B.E. (CSE / IT) II – Semester (Main) Examination, June 2017

Subject: Object Oriented Programming Using C++

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 are the object oriented programming concepts?	2
2	Define expressions. Give the operator precedence table.	2
3	What are I/0 streams?	2
4	Define structures.Give example.	2
5	Define string. List any four string manipulation functions.	2
6	What is the difference between static array and dynamic array?	2
7	Define Friend Function.	2
8	Discuss class templates and function template.	2
9	What is the difference between single linked list and double linked list?	2
10	What is virtual function? Define.	2

PART – B (5x10 = 50 Marks)

11	a)	What are the applications of OOPs? Discuss.	5
	b)	Write a program to generate Fibonacci series using recursive function.	5
12	a)	What are the testing and debugging functions?	5
	b)	Write a program to demonstrate call by value and call by reference.	5
13	a)	Write a C++ program to find the maximum and minimum number among ‘n’ numbers using for loop.	
	b)	Draw a flow chart to find if a given number is a prime number or not.	5
14	a)	Write a program to illustrate the constructors and destructors.	4
	b)	Define inheritance. Explain types of inheritance with an example.	6
15	a)	Define polymorphism with an example.	5
	b)	Explain operator overloading with an example.	5
16	a)	Write a C++ program to insert an element in a single-linked list.	5
	b)	Write a program to implement stack using linked list.	5
17	a)	Write a program to sort ‘n’ numbers using bubble sort technique.	5
	b)	Explain function overloading. Illustrate with example.	5

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