Code No. 11371 / BL

FACULTY OF ENGINEERING

B.E. I - Semester (CBCS) (Backlog) Examination, May/June 2019

Subject : Engineering Mechanics – I

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

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

PART – A (20 Marks)

1 Explain law of parallelogram of forces.

2 State Lami's theorem.

3 The dot product of two similar vectors is zero, find the angle between two vectors.

4 Resultant of two forces P= 847N and Q= 238N produces a resultant R= 609N. Find the angle between P and R.

5 Define cone of friction with a neat sketch.

6 A belt embraces an angle of 200^0 over the surface of a pulley of 500mm diameter. If the tight side tension of the belt is 5000N, find out the slack side tension of the belt. The coefficient of friction between the belt and the pulley can be taken as 0.2.

7 Define a truss. Mention the uses of a truss.

8 Prove that product of inertia w.r.t. axes of symmetry is zero.

9 State transfer formula for moment of inertia.

10 State Pappus theorems.

PART – B (5x10=50 Marks)

11 The three forces shown on the plate in figure (1) produces a horizontal force through point 'A'. Find the magnitude and sense of 'P' and 'F'. Each grid shown in figure is of square of one unit. (10)

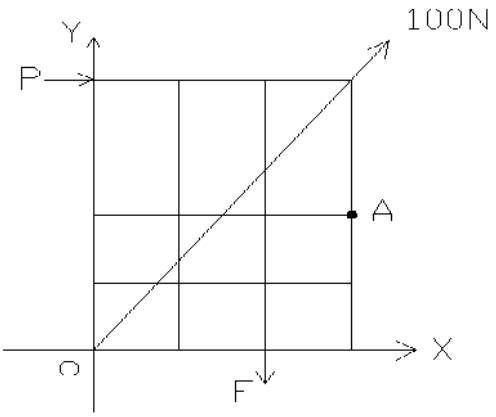

Figure (1)

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12 Bar AB of negligible weight is subjected to a vertical load of 300N and of horizontal force 100N as shown in figure (2). Determine the angle 'θ' at which the equilibrium exists. Assume smooth inclined surfaces. (10)

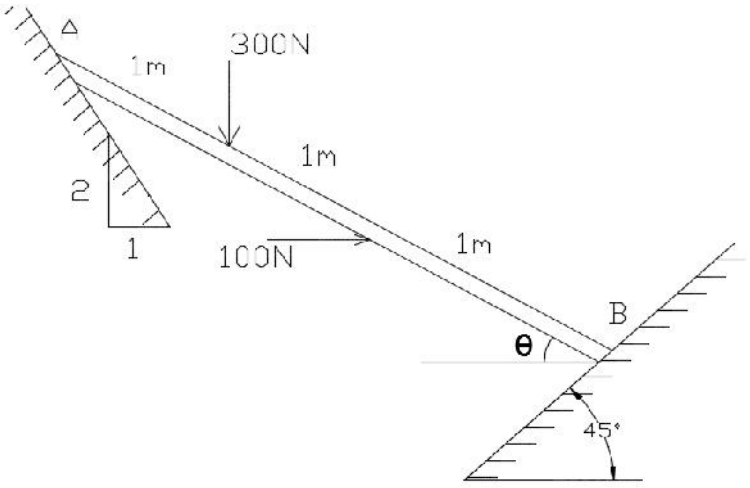

Figure (2)

13 A space force system consisting of a force F=15i and moment M=40i+30j both acting at origin. Convert the system into an equivalent wrench and state its position. (10)

14 A homogenous cylinder of weight 300N rests on a horizontal floor in contact with a vertical wall shown in the figure (3). If the coefficient of friction at all contact surfaces is 0.3, determine the couple 'M' acting on the cylinder which will start anti clockwise rotation. Take the diameter of cylinder as 100mm. (10)

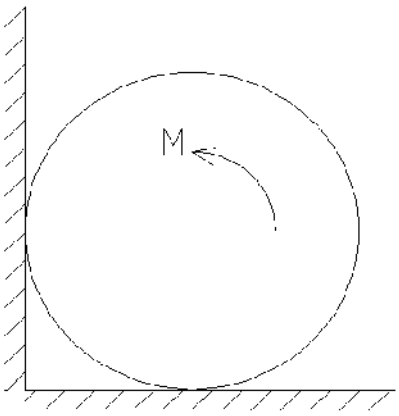

Figure (3)

15 For the truss shown in figure (4), find the forces in all the members of truss. (10)

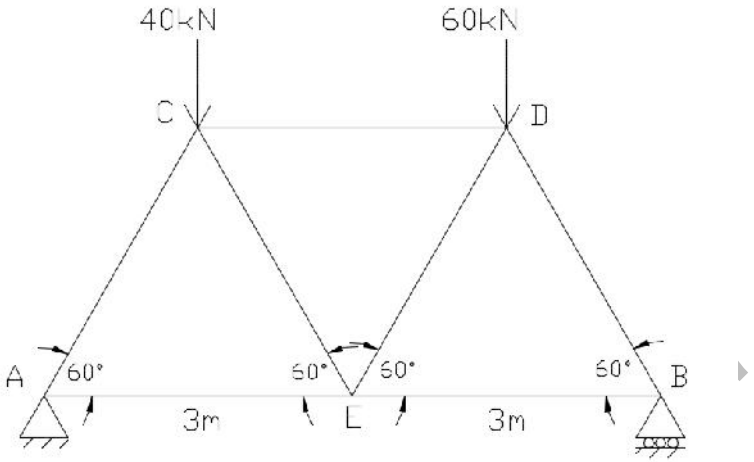

Figure (4)

16 (a) Find the centroid of a semicircular area of radius 'R'. (5)

(b) Using pappus theorem, determine the volume of a right circular cone of base radius 'R' and height 'H'. (5)

17 An I-section consists 100mmx 10mm top and bottom flanges connected by a centrally placed web 8mmx 120mm. determine the moment of inertia of the section about its both centroidal axes. (10)

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Code No: 11045/BL

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) II – Semester (Backlog) Examination, May / June 2019

Subject: Surveying – II

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) Explain the uses of a theodolite . 2

2) What are the errors that are eliminated by repetition method? 3

3) State the difference between ordinary leveling and trigonometric leveling. 2

4) How do you adjust traverse by Bowditch method? 3

5) Mention any two methods of setting out a simple curve by chain and tape only. Explain them in brief. 2

6) Two tangents intersect at chainage 1190 m, the deflection angle being 36^{o}, calculate.
a) Mid ordinate b) Length of back tangent c) Apex distance 3

7) Name the different types of transition curves. Explain in detail about anyone. 2

8) A parabolic vertical curve is to be set out connecting two uniform grades of 0.8% and 0.9%. The rate of change of grades is 0.05% per chain of 20 m calculate the length of a curve. 3

9) Explain in detail about multiplying constant and additive constant in tacheometry. 2

10) What are the uses of total station? 3

PART – B (50 Marks)

11. a) How do you measure horizontal angle by reiteration method? 5
b) List out the errors in theodolite surveying. Explain one by one in detail. 5

12. a) The following are the lengths and bearings of the sides of a closed traverse ABCDA.

Line	Latitude in m	Bearing
AB	76.80	S 39^{o} $48'$ E
BC	195.60	N $36^{o}24'$ E
CD	37.20	N 21^{o} $12'$ W

Compute the length and bearing of the missing line DA. 5

b) The vertical angles to vanes fixed at 1.5 m and 3.5 m above the foot of the staff held vertically at a station of $+2^{0}\ 30' + 6^{0}\ 30'$ respectively. Find the horizontal distances and the R.L. of A, if the instrument axis is +430.500 m. 5

Contd…2..

13 Tabulate the necessary data to set out a right handed circular curve of 600 m radius to connect two straights intersecting at a chainage of 3605 m by Rankine's method of deflection angles, the angle of deflection being 25^0 and peg interval30m. 5

14. A -1.0% grade meets a +2,0% grade at station of elevation 328.605 mts. A vertical curve of the length 120m is to be used. The pegs are to be fixed at 10m interval. Calculate the elevations of the points on the curve by tangent correction method. 10

15. A tacheometer fitted with an analytic lens was set up at a station. A and the following readings were obtained on a vertically held staff. R.L. of B.M. was 100.00. Calculate the horizontal distance AB and R.L. of B .. 10

Station	Staff	Vertical angle	Hair reading
A	B.M.	$-2^0\,18'$	1.500, 1.800, 2.450
A	B.	$+8^0\,36'$	0.750, 1.500, 2.250

16 a) Explain different parts of a theodolite with figure. 5
b) Distinguish between loose needle and fast needle method of traversing. 5

17. Answer any two questions from the following
a) Setting out curve by mid-ordinate method.
b) Cubic parabola in transition curves.
c) Principle and components of GPS. 10

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Code No. 11051/BL

FACULTY OF ENGINEERING

B.E. 2/4 (EEE/Inst.) II – Semester (Backlog) Examination, May/June 2019

Subject: Solid Mechanics

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

Note: Answer All Questions from Part – A & Any Five Questions from Part – B

Part – A (25 Marks)

1. Differentiate between elastic and plastic materials. 3
2. Draw the stress-strain curve for Tor steel and copper. 3
3. Define three elastic constants 3
4. Explain the terms shear force and bending moments. 2
5. Define Pure bending theory. 2
6. Draw the shear stress distribution for I &T-Sections 3
7. What is the Max deflection of the beam shown in fig.1 Trace EI, constant… 3

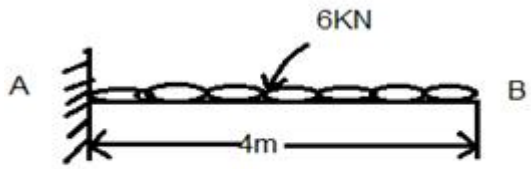

Fig. 1 Cantilier Beam

8. Give the equations for sudden and Impact loads. 2
9. Give any two assumptions made in Pure torsion 2
10. Explain how shear stress develops in spring. 2

Part – B (50 Marks)

11. A steel flat of thickness 10 mm tapers uniformly from 60 mm at one end to 40 mm at other end in a length of 600mm. If the bar is subjected to a load of 60 KN find the extension of it. Take E = $2x10^5$ MPa. What is the percentage error if average area is used for calculating extension. 10

12. Draw shear force and bending moments for the figure show in 2 10

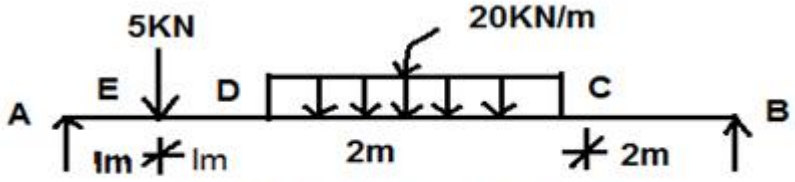

Fig 2 Simply Supported Beam

Contd….2

13. a) List out the assumptions made in simple bending theory. 4
    b) A simply supported beam of span 5m has a cross section 150 mmx250 mm. If the permissible stress is 10N/mm^2. Find the maximum intensity of Uniformly distributed load it can carry and maximum concentrated load 'P' applied at 2m from one end it can carry. 6

14. A long rectangular wall is 2.5 wide. If the maximum wind pressure on the face of the wall is 1.1 KN/m^2, Find the maximum height of the wall so that there is no tension in the base of the wall. The specific weight of masonry is 22 KN/m^3. 10

15. Obtain the maximum deflection of the beam as shown in fig 3. Take 'EI' 10

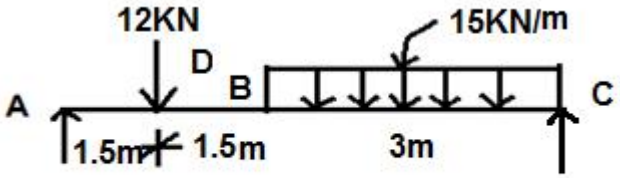

Fig. 3 Simply Supported Beam

16. Derive the equation for pure torsion theory. 10

17. A bumper is to be designed to arrest a Wagen weighing 500 KN moving at 18KN/hour. Sizes of buffer springs available are having diameter = 30 mm, mean radius = 100 mm, number of turns = 18, modulus of rigidity 80 KN/ mm^2 and maximum compression permitted = 225 mm. Find the number of springs required for the buffer. 10

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Code No.11059 / BL

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II – Semester (Backlog) Examination, May / June 2019

Subject: Analog Electronic Circuits

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 Show that the Darlington pair has a very high input impedance. [3]
2 Find the value of current gain A_i, given h_{fe} =100, h_{oe} = 25x10^{-6} and R_i=5 KΩ. [2]
3 Mention the characteristics of a negative feedback amplifier. [2]
4 Given A=400. Calculate gain with feedback if 5% of output is given as negative feedback to the input. [3]
5 Differentiate between series and shunt voltage regulator. [3]
6 Draw the block diagram of positive feedback amplifier and obtain expression of gain with feedback. [2]
7 Define the figure of merit in a power amplifier. [2]
8 Give the classification of power amplifiers with respect to position of Q point [3]
9 What is frequency deviation in a tuned amplifier? [2]
10 Given f_0=20 MHz and Q=15. Calculate bandwidth of single tuned and double tuned amplifiers. [3]

PART – B (50 Marks)

11 a) Obtain the expression for low frequency voltage gain under the effect of coupling capacitor C_c. [4]
b) What is the effect of cascading on the gain and bandwidth of amplifiers? Obtain the expression of Bandwidth for an n stage amplifier. If for a single stage amplifier BW= 10 MHz, Calculate the bandwidth for a three stage amplifier. [6]

12 a) Draw the frequency response of open loop amplifier and closed loop amplifier and show that the gain bandwidth product remains constant. [6]
b) Given A_f = 10±0.1% and β = 0.1. Calculate open loop voltage gain A. [4]

13 a) Draw and explain the working of a Wein Bridge oscillator. [7]
b) Calculate f_o for wein bridge oscillator if R=20k ohm and C = 1kpF. [3]

14 a) Prove that the efficiency of Class B push pull power amplifier is 78.5%. [7]
b) A Class B push pull has a 12 ohm load and 1:15 transformer working on 18 V supply. Find P_{ac}, P_{dc}, Efficiency. [3]

15 Give the gain expression of single tuned direct coupled amplifier. [10]
16 a) Compare CE, CB, CC with respect to R_i, R_o, Phase shift and applications [4]
b) Show the effect of negative feedback on R_i and R_o of Voltage series amplifier. [6]

17 Write short notes on:
a) Crossover Distortion [4]
b) Cascode Amplifier [4]
c) Hartley Oscillator [3]

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Code No.11069/BL

FACULTY OF ENGINEERING

BE 2/4 (M/P) II – Semester (Backlog) Examination, May / June 2019

Subject: Fluid Dynamics

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

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

PART – A (25 Marks)

1. What is the difference between an Ideal and a real fluid? [2]
2. Determine whether the continuity equation is satisfied by the following velocity components for an incompressible fluid. [3]

   $u = x^2y$, $v = 2xz-xy^2$ $w = x^2-z^2$
3. Write the assumptions made in the derivation of Bernoulli's equation. [2]
4. Convert a pressure head of 100 m of water to kerosene of specific 0.81 and carbon tetrachloride of specific gravity 1.6. [2]
5. An oil of viscosity 9 poise and specific gravity 0.9 is flowing through a horizontal pipes of 60 mm diameter. If the pressure drop in 100 m length of the pipe is 1800 kN/m^2 determine the centre line velocity. [3]
6. Define the terms: major energy loss and minor energy losses in pipe. [3]
7. Define drag force and life force of an object immersed in a fluid. [2]
8. Define the term "No slip condition" and explain the formation of BL on flat plate at low Reynolds number. [3]
9. Define Mach Number and Mach angle. [2]
10. Derive the continuity equation in differential form in case of compressible fluid flows. [3]

PART – B (50 Marks)

11. a) A cylinder of 100 mm diameter and 300 mm length rotates about about a vertical axis inside a fixed cylindrical tube of 105 mm diameter and 300m length. If the space between the tube and the cylinder is filled with liquid of dynamic viscosity of 0.125 N-s/m^2, determine the speed of rotation of the cylinder which will be obtained if an external torque of 1Nm is applied to it. [5]

    b) What is 'flow net'? Is the flow net analysis applicable to rotational flow? If not, why? Also, show that streamlines and equipotential lines from a net of mutually perpendicular lines. [5]

12. a) A 45^o reducing bend is connected in pipeline, the diameters are at the inlet and outlet of the bend being 400 mm and 200 mm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet of the bend is 251.8 kN/m^2. The rate of flow of water is 0.5 m^3/sec. [5]

    b) A pipe 300m long has a slope of 1 in 100 tapers from 1.0m diameter at the higher end to 0.5m at the lower end. Quantity of water flowing is 90 liters/sec. If the pressure at higher end is 70 kN/m^2, find the pressure at the lower end. [5]

Contd..2

13. a) Sketch and explain various manometers and the theory of determining the pressure. [5]
    b) A 10x 5 cm venturimeter is used to measure the discharge flowing in a pipe line. The mercury shows a deflection of 120 mm. Assuming the co-efficient of discharge as 0.97. Determine the rate of flow of water. [5]

14. a) Derive an expression for the velocity distribution for viscous flow through a circular pipe. Also, sketch the distribution of velocity and shear stress across a section of the pipe. [5]
    b) The discharge of water through a horizontal pipe is 0.25 m^3/sec. Its diameter, which is 200 mm suddenly enlarges to 400 mm. If the intensity of pressure of water in the smaller pipe is 120 kN/m^2, determine. [5]
    i) Loss of head due to sudden enlargement
    ii) Intensity of pressure in the large pipe
    iii) Power lost due to enlargement

15. a) A gas with a velocity of 300 m/s is flowing through a horizontal pipe at a section where pressure is 60 kN/m^2.(abs) and temperature 40^oC, the pipe changes in diameter and this section the pressure is 90kN/m^2. If the flow of gas is adiabatic, find the velocity of gas at this section. (Take R = 287 J/kg k and k = 1.4) [5]
    b) Derive an expression for Bernoulli's equation when the process is adiabatic. Also, discuss about the stagnation point of an object immersed in fluid. [5]

16. a) What is Venturimeter? Derive the expression to estimate the Discharge. [5]
    b) Given the velocity field:
    $V = (6 + 2xy + t^2)I – (xy^2 + 10t)j + 25k$
    What is the acceleration of a particle at (3, 0, 2) at time t=1? [5]

17. Answer the following questions
    i) Pilot tube: Its principle and applications [3]
    ii) Hydrodynamically smooth and rough pipes: variation of friction factor [3]
    iii) Separation of boundary layer [4]

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Code No: 11071/BL

FACULTY OF ENGINEERING

B.E. 2/4 (A.E) II – Semester (Backlog) Examination, May/June 2019

Subject: Fluid Mechanics & Machinery

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 capillarity and surface tension. [3]
2. Distinguish between gauge pressure and Vacuum Pressure? [2]
3. What is meant by 0ne-dimensional, two dimensional and three dimensional flows? [3]
4. What are the applications of Bernoulli's equation? [2]
5. Explain the terms Hydraulic gradient and total energy lines. [3]
6. Define drag and lift. [2]
7. Classify fluid machines. [3]
8. Difference between Main characteristics and operating characteristics of hydraulic turbines. [2]
9. Define slip, percentage slip and coefficient of discharge of a Reciprocating pump. [3]
10. Define specific speed of a centrifugal pump. [2]

PART – B (10 x 5 = 50 Marks)

11. a) Explain Compressibility and Bulk Modulus. [4]
    b) The right limb of a U-tube manometer is opened is opened to the atmosphere. The left limb contains water and is connected to a pipe full of water at a pressure. The free surface of the mercury and the center of the are the same level. If the difference of level between the two mercury surfaces is 80 mm, find the pressure intensity of water in the pipe. [6]

12. a) Distinguish between
        i) Steady and unsteady
        ii) Laminar and turbulent flow [4]
    b) For a three dimensional flow field described by [6]

    $V = \left(y^2 + z^2\right)i + \left(x^2 + z^2\right)j + \left(x^2 + y^2\right)k$

    find at (1,2,3)
    i) the components of acceleration
    ii) the components of rotation.

13. Two pipes each 250 m long are available for connecting to a reservoir from which a flow of 0.08 m^3/s is required. The pipe diameters are 10 cm and 20 cm respectively. Compare the head loss through the system if the pipes constitute a series and parallel arrangement. Neglect minor losses due to pipe transitions and fittings. Assume f = 0.01 in the Darcy relation $h_f = 4flv^2/2gd$ [10]

Cont..2

14. a) Explain the working principle of a Pelton wheel with a neat sketch. [4]
    b) Classify hydraulic turbines. [6]

15. a) A single acting reciprocating pump has the plunger diameter of 20 cm and stroke of 30 cm. The pump discharges 0.53 m^3 of water per minute at 60 rpm. Find theoretical discharge, co-efficient of discharge and percentage slip of the pump. [5]
    b) The axis of a centrifugal pump is 2.5 m above the water level in the sump and the static lift from the pump center is 32.5 m. The friction losses in the suction and delivery pipes are 1 m to 8 m respectively; suction and delivery pipes are each 12 cm in diameter. At outlet, the diameter and width of the impeller are 30 cm and 1.8 cm respectively and the vanes are set an angle of 30o with Tangent to the wheel. For a speed of 1800 rpm, mechanical efficiency 0.75 and manometric efficiency 80%, Calculate the discharge and power required to drive required to drive and the pump. Assume radial entry. [5]

16. a) Explain Boundary Layer Separation. [5]
    b) A smooth pipe 200 mm in diameter conveys crude oil at a velocity of 3 m/s. Find the loss of head per 100 m length of pipe. The kinematic viscosity of crude oil is 5 stokes. [5]

17. a) Explain factors affecting in Reciprocating pump. [5]
    b) Explain Bucking ham's Theorem in explanation of fluid dynamics. [5]

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Code No: 11073/BL

FACULTY OF ENGINEERING

BE 2/4(CSE) II-Semester (Backlog) Examination, May / June 2019

Subject : Object Oriented Programming Using Java

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

Note: Answer all Questions from part -A & Any Five Questions from part-B.

PART-A (25 MARKS)

1) What is the difference between method overloading and method overriding? 2
2) How are interfaces more useful than abstract classes? 3
3) What is the purpose of "finally" keyword? 2
4) In what situations do deadlocks Occur while using threads? 3
5) What is the difference between HashSet and Linked HashSet classes? 3
6) What is the use of Random class? Give its syntax. 2
7) How paint() method can be useful in Graphics class? Explain. 2
8) Write a java code that adds pop-up list of items using Choice class. 3
9) What is the difference between Buffered Reader and Buffered Writer classes? 3
10) Write a java code for creating simple text file using FileOutputStream class. 2

PART-B (50 Marks)

11) a) Explain briefly about object oriented programming concepts. 5
b) What is the use of a package? Write a java program to explain the concept of package. 5

12) a) Write a java program that demonstrates user defined exceptions. 5
b) What is the difference between String and String Buffer classes? Explain with an example. 5

13) a) Define map. How to store data using Map interface? Explain with an example. 5
b) Discuss about Comparator interface with an example program. 5

14) a) Explain the concept of event delegation model. 6
b) Explain FileDialog class with suitable example. 4

15) a) Define Serialization. Write a program to demonstrate it. 5
b) Explain about DataOutputStream and DataInputStream classes. Write a necessary code for it. 5

16) a) Explain briefly about following String handling methods: 5
i) substring() ii) get Chars () iii) split() iv) trim() v) replace first ()
b) Write a java program that demonstrate dynamic method dispatch. 5

17) a) Write a java program to copy elements from one array into another array using array copy() method and display the copied array in ascending order. 5
b) Write short notes on Wrapper classes. 5

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Code No. 11080 / BL

FACULTY OF ENGINEERING

B.E. 2/4 (IT) II – Semester Examination, May / June 2019

Subject: OOP Using JAVA

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

Note Answer all question from Part – A & any five questions from Part-B.

PART – A (25 Marks)

1. What is a "Java byte code"? 2M
2. When is a constructor executed? 2M
3. Define an abstract class? Give an example. 3M
4. What are the advantages of using the packages? 3M
5. In nested try blocks, what happens to an exception that is not caught by the inner block: 2M
6. What are the two ways in which you can determine whether a thread has ended? 3M
7. How do you convert map elements into collection-Set? 3M
8. Can a finally block be used to close a file? 2M
9. How is applet differ from stand atom application program? 3M
10. What is the use of adapter classes? 2M

PART – B (50 Marks)

11. Write a method reverse() that takes an integer array as its parameter and reverses the order of the elements in the array. (5+5)
    (a) Iteratively
    (b) recursively

12. Create a subclass of Two D shape calted circle. Include an an area of the circle and a constructor that user super to initialize the Two Dshape portion. 10

13. What is the significance of main thread in multithreading. Explain with an example how you can control main thread. 10

14. Create a Hashmap program of string as key and integers as values and convert the map elements to collection set and retrieves the values and keys. 10

15. Write a program for creating and manipulating the ratio button. 10

16. If we try to catch a super class exception type before a subclass type, compiler generates exception errors. Explain why this error occurs with an example. 10

17. Write a program to create a simple login page with 2 labels, 2 Text fields and 1 Button with swings. 10

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