Code No. 191/N

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II - Semester (New) (supply) Examination December 2017

Subject: Theory of Structure - II

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

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

Part - A (25 Marks)

1 Calculate the length of suspension cable of span 300m and central dip of 12m supports of the cable are at the same level. 2

2. Define enveloping parabola 2
3. State properties of stiffness matrix 2
4. Define flexibility 2
5. Name two soft wares used in the field of structural analysis 2
6. A U.D.I of intensity 20 kN/m and length 5m, crosses a simply supported girder of span 20m calculate the EUDLL 3

7 A Pratt truss of 20m span of 4 panels has a height of 3m sketch the influence line for force in bottom chord of 2nd panel calculated the member force if the entire span is loaded by a UDL of 20 kN/M 3

8. Develop the stiffness matrix for the beam shown in fig 1 3

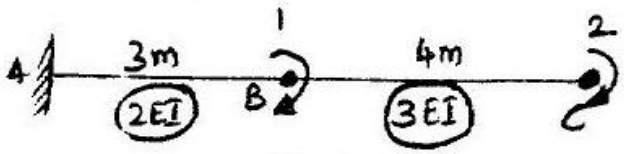

Fig.1

9. Find the support reaction at the prop of a propped cantilever beam of level 'l' subjected to a UDL of intensity 'W' per unit length using flexibility method. 3
10. A Structure has the following stiffness matrix. Develop flexibility matrix 3

$$(K) = EI \begin{bmatrix} 3.2 & 0.24 & 0.8 \\ 0.24 & 0.144 & 0.24 \\ 0.8 & 0.24 & 2.4 \end{bmatrix}$$

Part - B (50 Marks)

11. A simply supported beam of clear span 40m is subjected to a series of concentrated loads as shown in fig. 2. Determine position of loads for max. Values of (a) Reaction at right end (b) shear force at 15m from left end (c) Bending moment at 18m from the left end.

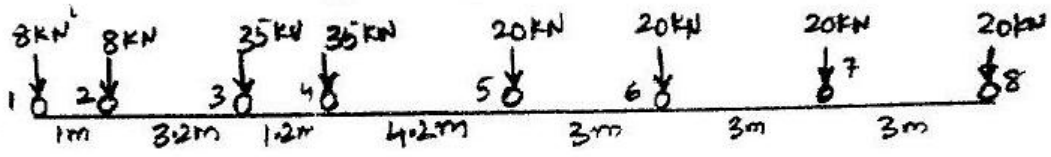

Fig. 2

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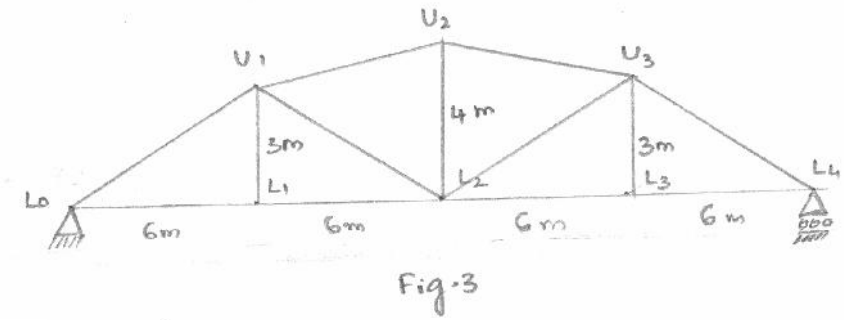
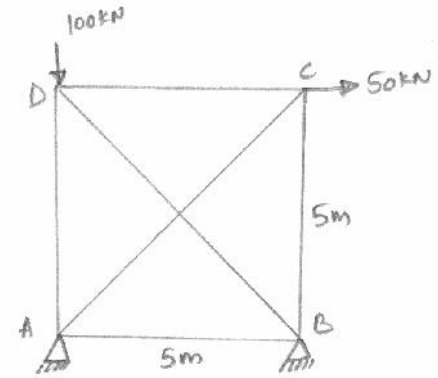
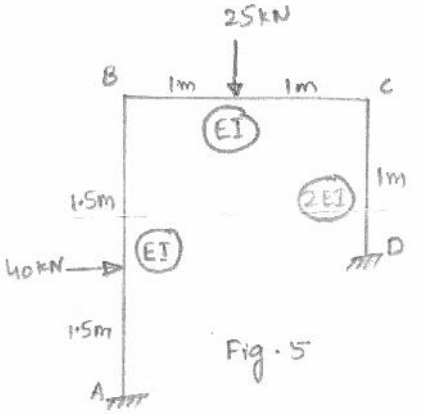


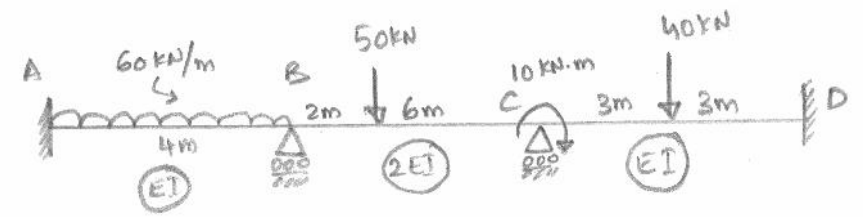
Fig·3



Fig·4



Fig·5



Fig·6

12. Construct the influence line diagram for forces in the members U,L_1, L_1L_2 and U_1L_2 for the truss shown in fig. 3 Hence calculate the forces in these members due to a dead load of 20 KN/m and moving live load of 30 KN/m which its longer than the span.
13. Analyze the truss shown in fig . 4 by using flexibility matrix method, AE constant
14. Analyze the plane frame shown in fig. 5 using stiffness matrix approach Also draw BMD
15. A Suspension bridge of 150m span has a three hinged stiffening girder supported by cables having a central dip of 20m. The right half of the of the bridge is loaded with uniformly distributed load of intensity 50 KN/m. Determine the reactions. Also draw BMD and SFD for stiffening girder. Assume the dead weight of the bridge as 20 KN/m.
16. Analyze the continuous beam shown in fig. 6 by any of the matrix method also draw BMD.
17. a) Explain static indeterminacy kinematic Indeterminacy with examples.

    b) Explain various advantages of matrix method of analysis

    c) Explain about enveloping parabola.

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Code No. 144/O

FACULTY OF ENGINEERING

B.E 3/4 (Civil) II – Semester (Old) Examination, December, 2017

Subject : Theory of Structure - II

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

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

Part – A (25 MARKS)

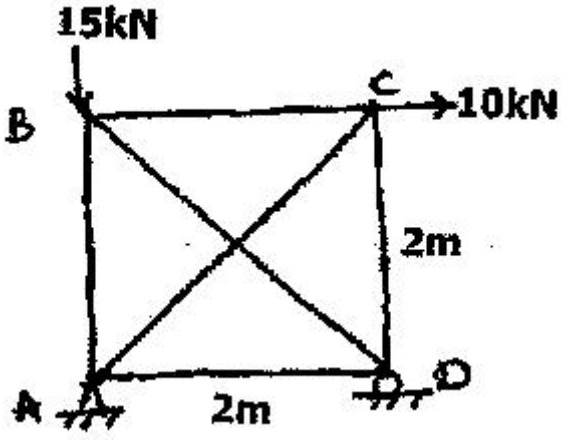
1. Define Equivalent Uniformly Distributed Load (E.U.D.L). 3
2. State Eddy's theorem. 3
3. A suspension cable of horizontal span 40m, central dip 4 m is subjected to a load of 10kN/m over the entire span. Find the maximum tension in the cable. 3
4. State three properties of stiffness matrix. 3
5. Write the conditions for maximum BM at a section when several concentrated loads are traversing a simply supported girder. 3
6. Write the expression for horizontal thrust and normal reaction of two hinged arches. 2
7. Distinguish between Force and displacement method. 2
8. Develop stiffness matrix for 2D truss element
9. Define Kinematic Indeterminacy. 2
10. Derive the formula for temperature effects in 2 hinged arch. 2

Part - B (5x10 = 50 Marks)

11. A uniform load of 3 kN/m, 3 m long, crosses a girder of 12 m span. Calculate the Maximum SF and BM at 4m and 6m from the left hand support. Also, draw maximum BM and SF diagrams.

12. A three hinged parabolic arch of 20m span has its crown 9m high from the left hand support and 4m high from the right hand support. The crown is 12m from the left hand support. It is subjected to au.d.l. of 20 kN/m over the left half of the span and a point load of 60 kN at 4m from the right hand support.
    Find a) B.M. at 15m from left hand support and
    b) Normal thrust and radial shear at 8m from left hand support.

13. Analyze the truss shown in fig. using stiffness matrix method. Assume AE as constant.



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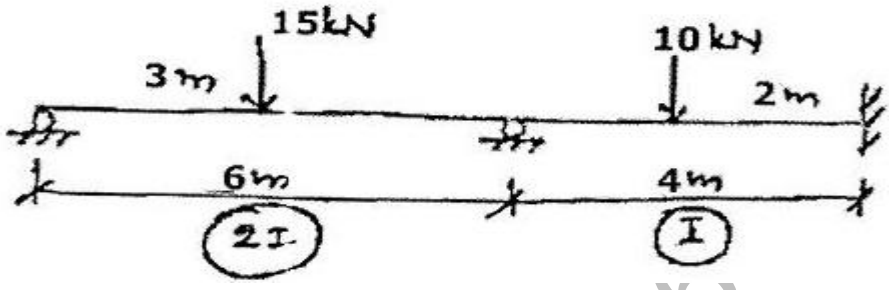
14. Analyze the beam shown in figure by Flexibility matrix method and draw BMD. E is constant.



15. A system of 5 concentrated loads 100 KN, 200 KN, 200 KN and 160 KN separated by distance of 3m, 4m, 4.5m and 3m respectively are traversing a simply supported girder from right to left with 100 KN load as leading load. Determine the maximum SF and BM at the quarter span.

16. A cable is suspended between two points A and B located 50m apart. Point B is higher than point A by 12.5m At mid – span the cable is located 9.375m below A. The load on the cable is distributed uniformly per unit length of the span. Determine the position and sag of the lowest point and also the curved length of the cable.

17 Write short notes on the following:
   a) Influence line diagram
   b) Enveloping Parabola
   c) Properties of stiffness matrix

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Code No. 197/N

FACULTY OF ENGINEERING

BE 3/4 (EEE) II- Semester (New) (Supplementary) Examination, December, 2017

Subject: Switch Gear and Protection

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		Give the classification of relays based on operating principles.	2
2		Where is directional relay used?	2
3		What are the advantages of micro processor based relays over other conventional type of relays?	3
4		Explain distance protection? What do you understand by R-X diagram?	3
5		What is meant by differential relay?	2
6		What is Buchholz relay? Mention its disadvantages.	3
7		Classify the circuit breakers based on operating voltages.	2
8		What is resistance switching?	3
9		Give a brief note on Peterson coil.	3
10		What is meant by surge absorber?	2

PART – B (50 MARKS)

11	a)	Discuss the principle of operation of induction disc relay with neat circuit diagram?	5
	b)	Explain in detail the over current protective scheme for radial feeder.	5
12	a)	What is meant by duality of comparator? With relevant diagram explain how Amplitude comparator is converted into phase comparator?	6
	b)	Draw and explain the characteristics of Mho relays on R-X diagram?	4
13	a)	What is magnetizing in rush current? Discuss the protection of transformer against magnetizing in rush current with neat diagram.	6
	b)	Explain protection of earthing transformer with neat diagram.	4
14	a)	Describe the construction, operating principle and applications of vacuum circuit breaker also mention its advantages.	8
	b)	Define RRRV.	2
15	a)	What is tower footing resistance, mention different methods to reduce it?	4
	b)	Classify different types of lightning arrestors also explain construction and working principle of valve type of lightening arrestor?	6
16	a)	Draw the block diagram of a Microprocessor based over current relay and explain its working principle.	5
	b)	Discuss briefly the testing of circuit breaker.	5
17		Write short notes on:	
	b)	Insulation coordination	5

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Code No. 150/O

FACULTY OF ENGINEERING

BE 3/4 (EEE) II- Semester (Old) Examination, December, 2017

Subject: Switch Gear and Protection

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 What are the essential qualities of switchgear protection? 2

2 Draw the characteristics of IDMT over current protection relay. 2

3 Define distance relay, classify them with advantages and applications. 3

4 The current rating of a relay is 5A. PSM = 1.5, TMS = 0.4, C.T ratio = 400 / 5, Fault current = 6000A. Determine the operating time of the relay. At TMS = 1, Operating time at various PSM are: 3

PSM	2	4	5	8	10	20
Operating time in seconds	10	5	4	3	2.8	2.4

5 Explain differential protection scheme. 2

6 Write short note on stator over heating protection. 3

7 What are the harmful effects of lightning on power system. 2

8 Explain briefly about methods of Arc extinction in circuit breakers. 3

9 What are the main causes of over voltages and under voltages, mention their remedial measures. 3

10 Explain how over head transmission lines are protected from direct lightning Strokes. 2

PART – B (50 MARKS)

11 a) Explain different over current protective schemes with neat diagram and their applications. 5

b) Discuss in detail about zones of protections in power system. 5

12 a) What is amplitude comparator? Explain integrated amplitude type circulating current comparator with neat diagram. 6

b) Explain briefly about 3-step distance relays. 4

13 a) Explain percentage differential protection of generators. 4

b) With neat diagram explain protection of transformers against magnetizing in rush current. 6

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14	a)	Explain in detail working principle of an oil circuit breaker and how does oil help in arc extinction with diagram.	6
	b)	Define and explain rated symmetrical and asymmetrical breaking currents.	4
15		Discuss the ideal characteristics of surge diverter and also explain construction and working principal of expulsion type of lightening arrestor along with advantages, disadvantages and their applications.	10
16	a)	What do you understand by instantaneous over current relay? Explain with The help of relevant block diagram.	5
	b)	Explain protection of alternator using stator inter-turn protection.	5
17.		Write short notes on:	
	a)	Rating of circuit breaker	5
	b)	Surge absorbers	5

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Code No. 201/N

FACULTY OF ENGINEERING

BE 3/4 (EIE) II- Semester (New) (Supplementary) Examination, December, 2017

Subject: Power Plant Instrumentation

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	What is meant by Attemperation?	3
2	Draw the P&I diagram of three element drum level control	3
3	Explain the basic principle involved in Nuclear power plant	3
4	What are non-conventional energy sources?	3
5	Draw the block diagram of power generation using TPP?	3
6	What are the different types of glands used in steam exhaust control?	2
7	What is meant by feed water conditioning?	2
8	How many types of condensates systems are present in TPP?	2
9	What are the types of non-contact type transducers for speed measurement?	2
10	Draw the correct position of economizer in feed water control	2

PART – B (50 MARKS)

11	a) With a neat diagram explain the turbine following mode?	7
	b) Write briefly about draught in TPP?	3
12	With a neat diagram explain lubricating oil temperature control in turbine Supervision and control system?	10
13	With a neat diagram explain the power generation in Nuclear Power Plant (NPP) and explain the importance of control rods in NPP?	10
14	a) With a neat block diagram explain TSI (Turbine Supervisory Instrumentation)	6
	b) Discuss about Flame monitoring?	4
15	With relevant diagrams explain piping system for pressure measuring devices in TPP?	10
16	Explain with a process diagram the fuel-air ratio control and discuss about O_2 Trimming methods?	10
17	Write short notes on	
	a) P & I diagram of boiler	6
	b) Boiler drum level control system	4

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Code No. 155/O

FACULTY OF ENGINEERING

BE 3/4 (Instrumentation) II- Semester (Old) Examination, December, 2017

Subject: Power Plant instrumentation

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	Write the brief statistics for 100 MW power generation in Thermal Power Plant.	3
2	What are the different types of burners used in process of combustion in Thermal power plant?	2
3	What are the various types of control loops that can be formulated for efficient functioning of boilers?	3
4	What is meant by TSI? What are the types of speed governors for monitoring turbine speed?	2
5	What are the different types of glands used in steam exhaust control?	3
6	What is meant by feed water conditioning? Show the correct position of economizer?	2
7	What are the different types of non-conventional sources of power generation?	3
8	How many types of condensate systems are present in TPP?	2
9	What is the basic difference between three element and two element Drum Level control?	3
10	What is the function of control rods in NPP?	2

PART – B (50 MARKS)

11	With a neat diagram explain the boiler following mode and turbine following modes in boiler automation?	10
12	a) With a neat diagram explain smoke and dust monitoring.	5
	b) Discuss about Flame monitoring?	5
13	Explain with a process diagram the fuel-air ratio control methods and discuss about excess air trimming methods?	10
14	a) With a neat diagram explain hydrogen generator cooling system.	5
	b) Draw the diagram of heat exchanger used in turbine supervision and control.	5
15	Discuss about the control and safety instrumentation methods for NPP? What safety measures have to be taken for setting up of NPP?	10
16	Write short notes on	
	a) Piping systems for pressure measuring devices	5
	b) Fan drives and control	5
17	What is meant by draught in thermal power plant? Explain different types of draught with neat diagram.	10

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Code No. 206/N

FACULTY OF ENGINEERING

BE 3/4 (ECE) II - Semester (New) (Supplementary) Examination, December, 2017

Subject: Antennas and Wave Propagation

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 significance of gain of an antenna?		2
2	If the radiation resistance of an antenna is 75 ohms and loss resistance 25 ohms. Compute the efficiency of an antenna		2
3	What are advantages and disadvantages of microstrip antenna?		2
4	Discuss the principle of pattern multiplication		3
5	What is the significance of pitch angle in helical antenna?		2
6	What is the basic concept of reflector antenna?		3
7	What are the advantages of an antenna arrays?		2
8	Define Binomial array		3
9	Define optimum working frequency		3
10	Discuss briefly about variations in ionosphere		3

PART – B (50 MARKS)

11	a)	An infinitesimal electric dipole is centered at the origin and lies along z-axis. Find the far-zone electric and magnetic fields radiated	6
	b)	Compare monopole antennas and dipole antennas	4
12		How to obtain two modes in helical antenna? Obtain the expression for axial ratio	10
13		With reference to paraboloids, explain the following with neat diagrams: a) f/D ratio b) Spill over and aperture efficiency c) Front to back ratio d) Different types of feeds.	10
14		What is End fire array? Derive the condition for maxima, null directions and also Calculate the beam width of an End fire array.	10
15	a)	Explain in detail about Ground wave propagation	6
	b)	A television transmitter antenna has a height of 169 meters and the receiving antenna has a height of 16 meters. What is the maximum distance through which the TV signal could be received by space propagation? What is the radio horizon in this case?	4

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16 a) Discuss in detail about design consideration of Rhombic antenna 5

b) Explain far field pattern of circular loop antenna 5

17 Write short notes on:

a) Yagi-Uda antenna 5

b) Sky wave propagation 5

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Code No. 159/0

FACULTY OF ENGINEERING

BE 3/4 (ECE) II- Semester (Old) Examination, December, 2017

Subject: Antennas and Wave propagation

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 the terms a) MUF b) Critical angle and c) Critical frequency of an antenna		3
2	Define pattern multiplication for antenna arrays		2
3	Explain the broad-side and end-fire arrays		3
4	What are gain and directivity of an antenna?		2
5	State the advantages and disadvantages of lens antennas		3
6	If the critical frequency of an ionized layer is 1.5 MHz, then find the electron Density of the layer		2
7	What are the advantages of cassegrain feed for a parabolic reflector?		3
8	Distinguish between the normal and axial modes of a helical antenna		3
9	Define retarded potential		2
10	Calculate the voltage (in milli-volts) induced by a plane wave of field strength 0.01 $\frac{v}{m}$ and frequency 1 MHz in a vertical antenna 8 meters high		2

PART – B (50 MARKS)

11	a)	Define the terms (i) radiation intensity and (ii) radiation resistance of an antenna	4
	b)	What is effective length of an antenna? How to calculate its value for transmitting and receiving antennas?	6
12	a)	What are near and far fields of a radiating element?	5
	b)	Determine the electric field strength at a distance of 10 km from an antenna having a directive gain of 5 dB and radiating a total power of 20 KW.	5
13		What is the principle of radiation? Deduce an expression for radiation resistance of a half-wave dipole.	10
14	a)	What are basic types of arrays? Explain.	5
	b)	Derive an expression for normalized field strength magnitude of a uniform linear array.	5
15		Define a point source. Derive and sketch the normalized E-field pattern of uniform Two-element array consisting of two isotropic sources of equal amplitude and phase.	10
16	a)	Briefly explain how gain measurement is carried out for an antenna.	4
	b)	Discuss the construction and working of horn antennas.	6
17	a)	Explain the three modes of wave propagation and briefly discuss about ionospheric abnormalities.	5
b)		At what frequency, a wave must propagate for the D-region to have a refractive index of 0.5. Take electron density equal to 400 for the given region.	5

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Code No. 210/N

FACULTY OF ENGINEERING

BE. 3/4 (Mech / A.E) II – Semester (New) (supply) Examination, December 2017

Subject: CAD/CAM

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

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

PART – A (25 Marks)

1. List the benefits of computer aided design in a manufacturing process (2)
2. What are the properties of splines? (3)
3. What is meant by concatenation? (2)
4. Define tabulated surface with neat sketch (3)
5. What is the role of post processor in NC machine tool? (2)
6. Give three codes with their functions in each of the preparatory and miscellaneous functions (3)
7. What are the advantages of adaptive control systems? (2)
8. Name any five industrial applications of robot (3)
9. Explain briefly about rapid prototyping technique (2)
10. Explain about flexible manufacturing systems (3)

PART – B (50 Marks)

11. Explain the concept and typical characteristics of Bezier and B – Spline curves (10)

12. a) Explain B-rep land C-rep approaches of solid modelling with examples for each (5)
    b) If a straight line having Co – ordinates A (z, z) and B (4,6) is rotated by 60o about a point (2,1) . What are the new Co – Ordinates of a straight line (5)

13 a) What are the various (A1) data base Models? (5)
   b) Briefly discuss the following NC motion control system
   (i) Point to point
   (ii) Straight cut
   (iii) Contouring (5)

14 a) What is DNC? Explain BTR and SMCU systems of DNC? (5)
   b) What are the Various controls and drives used in Robots Mention Some important application of industrial robots (5)

15 a) What is G.T? Describe MICLASS Coding system (5)
   b) Discuss about generative Process planning (5)

16 a) Differentiate Analytic and synthetic Entities (5)
   b) Discuss Parametric representation of a circle (5)

17 a) Define ZD 0 Transformation. Explain the types of ZD transformation with neat sketch (5)
   b) Magnify the triangle with vertices A (o,o) , B (1,1) and c (5,Z) to twice is size, while keeping c(5,Z) fixed (5)

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Code No. 164/O

FACULTY OF ENGINEERING

B.E. 3/4 (M/A.E) II – Semester (Old) Examination, December 2017

Subject: CAD / CAM

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

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

PART – A (25 Marks)

1. Write characteristics of Bezier curves. (2)
2. What are the advantages of parametric representation entities? (3)
3. List any four surface entities. (2)
4. What is finite element modeling? (3)
5. What are the advantages of canned cycle? (2)
6. Explain STEP and STL format. (3)
7. Write the difference between NC and DNC. (2)
8. Explain robot anatomy (3)
9. Give advantages of rapid prototyping. (2)
10. Explain in brief about flexible manufacturing system. (3)

PART – B (10 x 5 = 50 Marks)

11 (a) Explain properties of splines? (5)
(b) How NURBS are represented? Give its advantages in geometric modeling. (5)

12. Explain C-rep and B-rep with neat sketch of suitable example. (10)

13 (a) Explain CAD data base with an example. (5)
(b) If a straight line having co-ordinates A(2,2) and B(4,6)is rotated by 60 degree about a point (2,1). What are the new coordinates of a straight line? (5)

14 (a) What are the various controls and drivers used in robots? Mention some important application of industrial robots. (6)
(b) Explain the role of AGV in FMS. (4)

15 (a) Explain group technology in brief. (5)
(b) Describe the Optic coding system. (5)

16 (a) Explain 2D transformations for translation, scaling and rotation. (5)
(b) Magnify the triangle with vertices A(0,0) B(1,1) and C(5,2) to twice its size, while keeping C(5,2) fixed. (5)

17 What is CAPP. Explain the two types of process planning with neat sketch of flow charts. (10)

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Code No. 214/N

FACULTY OF ENGINEERING

B.E. 3/4 (Prod) II – Semester (New) (supply) Examination, December 2017

Subject: TURBO 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 turbo machine and classify.
2. What is the force exerted by the jet on a stationary vertical plate.
3. What is cavitation in centrifugal pumps what are its effects.
4. Differentiate between axial and centrifugal compressors.
5. What is specific speed of turbine state its significance.
6. What are unit quantities in turbines?
7. What is compounding of steam turbines.
8. Classify steam turbines.
9. What are the advantages of closed cycle gas turbine as compared to open cycle.
10. What are the methods of improving the efficiency of gas turbine?

PART-B (5x10 = 50 Marks)

11. A jet of water having a velocity of 15m/s ,strikes a curved vane which is moving with a velocity of 5m/s in the same direction as that of the jet at inlet the vane is so shaped that the jet is deflected through 135^o the diameter of jet is 100mm. assuming the vane to be smooth, find
    (i) force exerted by the jet on the vane in the direction of motion
    (ii) power exerted on the vane and
    (iii) efficiency of the vane

12. (a) Derive an expression for specific speed of a centrifugal pump.
    (b) A axial flow compressor with an overall isentropic efficiency of 85% draws air at 20^oC and compresses it in the pressure ratio of 4:1 The mean blade speed and flow velocity Are constant throughout the compressor. Assuming 50% reaction blading and taking Blade velocity as 180m/s and work input factor as 0.82 calculate:
    (i) Flow velocity (ii) Number of stages Take $\acute{\alpha}_1=12^o$,$\beta_1=42^o$

13. (a) Explain the working of inward radial flow turbine.
    (b) A pelton wheel is to be designed for the following specifications :
    Shaft power =11,772kW; head=380metres; speed=750rpm; overall efficiency =86%; jet diameter is not to exceed one sixth of the wheel diameter determine
    (i) The wheel diameter
    (ii) The number of jets required and
    (iii) Diameter of the jet
    Take $k_{v1}=0.985$ and $k_{u1}=0.45$

..2

14. A single stage steam turbine is supplied with a steam at 5 bar 200^0C at the rate of 50kg/min it expands into a condenser at a pressure of 0.2 bar . The blade speed is 400m/s the nozzles are inclined at an angle of 20^0 to the plane of the wheel and the oulet blade angle is 30^o Neglecting friction losses determine the power developed , blade efficiency , and stage efficiency.

15. A gas turbine unit has a pressure ratio of 6:1and maximum cycle temperature of 610^o C. The Is entropic efficiencies of the compressor and turbine are 0.80 and 0.82 respectively Calculate the power output in kilowatts of an electric generator geared to the turbine when the air enters the compressors at 15^oC at the rate of 16kg/s.
Take cp=1.005 kJ/kgK and γ=1.4 for the compression process, and
take Cp=1.11kJ/kgK and γ=1.333 for the expansion.

16 (a) What are losses in turbo machines
(b) What is degree of reaction in axial flow compressors?

17 (a) A turbine developes 9000kw when running at a speed of 140rpm and under a head of 30m determine the specific speed of turbine.
(b) Differentiate between impulse and reaction turbine.
(c) What is isothermal efficiency of compressor in gas turbine?

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Code No. 168 / O

FACULTY OF ENGINEERING

B.E. 3/4 (Prod.) II – Semester (Old) Examination, December 2017

Subject: Turbo Machinery

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

Note: i) Answer all questions from Part A and any five questions from Part B.
ii) Answer to the questions of Part-A and must be at one place and in the same order as they occur in the question paper.
iii) Candidate is advised not to attempt more questions than required.
iv) Missing data if any may suitably be assumed.
v) Use of data of book is permitted.

PART – A (25 Marks)

1 How Euler theorem is applied to turbo machine.
2 A 75mm diameter jet having a velocity of 30 m/s strikes a flat plate, normal to the axis of jet, which is moving with a velocity of 15 m/s away from the jet. Determine the power and efficiency of the jet.
3 Derive an expression for minimum speed of centrifugal pump.
4 Draw inlet and outlet velocity diagrams for centrifugal flow compressor with forward blace.
5 How hydraulic turbines are classified.
6 Draw velocity diagram for Francis turbine.
7 Draw pressure-velocity variations for velocity compounded turbine.
8 Draw velocity diagram for Parason turbine on common base of peripheral velocity.
9 Draw the configuration diagram and temperature-entropy diagram for open-cycle gas turbine with inter-cooling.
10 Define degree of reaction of gas turbine.

PART – B (5x10 = 50 Marks)

11 A Jet of water moving at 15 m/s impinges on a concave vane shaped to deflect the jet through 120^o when stationary. If the vane is moving at 4 m/s, find the angle of the jet so that there is no shock at inlet. What is the absolute velocity of the jet at exit in the magnitude and direction and the work done per second per kg of water, assume that the vane is smooth.

12 A centrifugal pump delivers water against a net head of 5 m and a design speed of 1000 rpm. The vane angles are carried back at an angle of 30^o with the periphery. The impeller diameter is 30 cm and outlet width is 5 cm. Determine the discharge of the pump if the manometric efficiency is 95%.

13 A centrifugal compressor running at 9000 rpm delivers 600 m^3/min of free air. The air is compressed from 1 bar and at 293 K to a pressure of 4 bars with an isentropic efficiency of 82%. Blades are radial at outlet of impellor and the flow velocity of 62 m/s is assumed constant throughout the impellor. The outer radius of impellor is twie the inner radius and slip factor is assumed as 0.9. The blade area coefficient of 0.9 may be assumed at inlet. Determine:

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i) Final temperatures of air
ii) Theoretical power required
iii) Impellor diameters at inlet and outlet
iv) Breadth of impellor at inlet
v) Impellor blade angle at inlet and
vi) Diffuser blade angle at inlet.

14 Details of Francis turbine: Speed 500 rpm, vane external diameter 70 cm, width 18 cm, if the guide vanes are at 20^o to the wheel tangent and the absolute velocity of water at inlet is 25 m/s find (i) the discharge of the turbine, (ii) the runner vane angle at inlet.

15 The air enters the compressor of an open cycle constant pressure gas turbine at a pressure of 1 bar and temperature of 17^oC. The pressure of the air after compression is 4 bar. The isentriopic efficiency of compressor and turbine are 85% and 90% respectively. The maximum temperature in the cycle is 723^oC. If the flow rate of air is 3.0 kg/s, find
i) Power developed
ii) Thermal efficiency of the cycle.
Assume Cp = 1.005 kJ/kg-K and ¥ =1.4 for air and gases.

16 Derive an expression for critical pressure ratio for maximum flow conditions of steam nozzle.

17 In a Parsons reaction steam turbine running at 1500 rpm, the available enthalpy drop of steam for the expansion is 65 kJ/kg. If the mean diameter of the rotor is 1 m, find the number of the rows of the moving blade required. Assume stage efficiency as 80%, blade outlet vane angle is 20^o and speed ratio is 0.7.

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Code No. 222 / N

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II – Semester (New) (Suppl.) Examination, December 2017

Subject: Compiler Construction

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 State error recovery techniques in top down parsing. [3]

2 What is an activation Record? What are its contents? [3]

3 What is Recursive Descent parsing? [3]

4 What is Shift Reduce and Reduce Reduce Conflict? [2]

5 What is Left Recursion? Eliminate left recursion from the expression: [3]

A → Aa | Ab | c | d

6 Discuss Garbage collection. [2]

7 Define Handle. Give an example. [2]

8 Construct a DAG for the statement: [3]

x = y * z , w = p + y , y = y * z , p = w - x

9 Define bottom-up parsing. [2]

10 Define type conversion. Explain its types. [2]

PART – B (5x10 = 50 Marks)

11 a) Explain the different phases of compilation with a neat diagram showing the output of each phase with an example. [6]

b What are the major data structures in a compiler. [4]

12 Is the given grammar SLR? Why? Construct the parsing table. [10]

E → E * B | E + B | B
B → 0 | 1

13 a) What is a syntax tree? Write SDD for constructing a syntax tree for the expression: (34 – 3) * 42 given the grammar: [6]

E → E + T | E – T | T
T → T * F | F
F → (E) | id | num

b) Explain data structures for implementing symbol tables. [4]

14. Explain storage organization in detail. [10]

15. Explain various code optimization techniques. [10]

16 a) What is a basic block? How do you divide the sequence of three address statements into basic blocks? Explain with a clear example. [5]

b). Explain Bootstrapping and Porting with examples? [5]

17 Give short notes on any two of the following: [10]

a) Brute Forcing Parsing
b) YACC
c) Data flow analysis.

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Code No. 176 / O

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II – Semester (Old) Examination, December 2017

Subject: Compiler Construction

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 Distinguish between Pass and Phase. (2M)

2 What is Boot Strapping? (3M)

3 What is Left Recursion? How to eliminate it? (3M)

4 Write applications of Syntax Directed Translation. (2M)

5 What is DAG Notation? (2M)

6 What is Symbol Table and Write the Operations of symbol table. (2M)

7 Write triple notation for the given expression (3M)

X:=-a*b+-a*b

8 What is Basic Block in Code Generation? (3M)

9 State the Parameter passing mechanisms in programming Languages. (2M)

10 What is Yacc? Explain the Syntax. (3M)

PART – B (5x10 = 50 Marks)

11 a) Explain the Translation Process. (6M)

b) Write Lex Specification for valid identifier and digits recognition (4M)

12 a) Show that the given grammar is LL(1) or Not (6M)

S→ iEts | iEtses | a

E→ b

b) What are the major Problems in topdown parsers explain with example? (4M)

13 a) Given Grammar G is SLR(1) or not (10M)

S → CC

C→ aC | d

14 Explain symbol table organization for block structured and non Block structured Languages. (10M)

15 a) Explain Peephole Optimization Techniques. (5M)

b) Explain Machine Independent Optimization. (5M)

…2

16 a) Write Error Recovery Strategies in Parsers. (6M)

b) List common errors in phases of a compiler. (4M)

17. Write Short Notes on: (10M)

a) Shift Reduce Parsers

b) Storage Organization

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Code No. 227 / N

FACULTY OF INFORMATICS

B.E. 3/4 (IT) II-Semester (New) (Supplementary) Examination, December 2017

Subject : Compiler Construction

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 Boot strapping. 2
2 Write a regular expression to identify floating point numbers. 2
3 Define left recursion removal. Remove left recursion from 3
$E \rightarrow E + T|T$
$T \rightarrow T * F|F$
4 Write short notes on YACC. 3
5 Define shift-reduce conflict and Reduce-reduce conflict. 3
6 Define synthesized and inherited attributes. 3
7 Define an attribute grammar. 2
8 Write the two address code for the following expression : $a * (b+c)$. 2
9 What is activation record? What are its content? 3
10 What is the role of symbol table? 2

PART – B (5 x 10 = 50 Marks)

11 Explain the compiler translation process with an example. 10
12 a) Construct NFA for the regular expression (a/b)* 4
b) Find the FIRST and FOLLOW from the grammar given below: 6
$S \rightarrow AaBD$
$A \rightarrow c \mid \in$
$B \rightarrow b \mid \in$
$D \rightarrow d \mid \in$

13 Construct a DFA of LR(0) items and the parsing table for the following grammar and show all the moves for the parsing of the input string ((a)) using the table :
$A \rightarrow (A) \mid a$ 10

14 a) Explain various parameters parsing mechanisms. 5
b) Explain stack based runtime environment. 5

15 What is a symbol table? Discuss the contents of the symbol table and explain the techniques for organizing the symbol table. 10

16 a) Discuss about code optimization techniques. 5
b) Write briefly memory organization during program-execution. 5

17 Write short notes on the following :
a) EBNF notations 3
b) Error recovery in Top down parsers 3
c) Type inference and type checking 4

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Code No. 181 / O

FACULTY OF INFORMATICS

B.E. 3/4 (IT) II-Semester (Old) Examination, December 2017

Subject : Compiler Construction

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 Differentiate between pass and phase. 2
2 Define recursive descent parsing. 2
3 Define left recursion; remove left recursion from the following productions.
exp $\rightarrow$ exp +term | exp -term | term. 3
4 Write LR(0) items for E $\rightarrow$ E+n / n 3
5 Write rules for computation of FIRST (x). 2
6 Differentiate between top-down and bottom up parsers. 2
7 Draw the DAG for the expression a: = b*-c+b*-c. 3
8 What is an activation record? What are its contents? 3
9 Write about use of algebraic identities. 2
10 Discuss about structure of YACC. 3

PART – B (50 Marks)

11 Explain the phases of a compiler with a neat diagram, showing the output of each phase, with an example. 10

12 Construct LL(1) parser for the following grammar 10
E $\rightarrow$ TE'
T $\rightarrow$ TE' | $\in$
T $\rightarrow$ FT' | $\in$
T' $\rightarrow$ *FT' | $\in$
F $\rightarrow$ (E) | id

13 Construct SLR parser for the following grammar 10
E $\rightarrow$ E *B | E + B | B
B $\rightarrow$ 0 | 1

14 a) Explain about memory Hierarchy of a computer. 5
b) Explain the issues in design of a code generator. 5

15 a) Explain the synchronization between parallel loops. 5
b) Discuss about a simple bootstrap loader. 5

16 a) Discuss about various code optimization techniques. 5
b) Translate the assignment statement a = b$*$c - b$*$d into quadruples and triples. 5

17 a) Explain about recursive descent parsing with an example. 5
b) Explain about LEX structure with an example program. 5

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