FACULTY OF ENGINEERING

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

Subject: Steel Structure

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	With the help of neat sketch explain the failure of bolt in double shear.	3
2	Distinguish between working stress method and limit state method.	3
3	Explain theory of plastic analysis.	3
4	List any five types of tension members with sketches.	3
5	Draw any three commonly used steel trusses and name them.	3
6	Explain with sketches the edge and end distances of bolts.	2
7	List any five types of structural steel.	2
8	Write any three effective lengths of a compression member with different end conditions.	2
9	Write the formulae for finding section modulus Z and plastic modulus Z_p for a rectangular section of cross-sectional dimensions b x d.	2
10	Draw a gusset base for a column and mark the parts.	2

PART – B (5x10 = 50 Marks)

11 Two steel plates 150 mm x 12 mm each are connected by single cover butt joint. They carry a force of 250 kN (factored). Design the joint using M_{20} grade 4.6 bolts.   10

12 A simply supported beam has an effective span of 6.2 m, it is subjected to a working load of 25 kN/m. Design the beam if it is laterally supported. Use LSD.   10

13 Find the load which a single angle tension member can carry. The member is ISA 100 x 100 x 10 mm. It is connected to the gusset plate through one bolt of grade 4.6 and dia 20 mm. Use Fe 410 steel for angles.   10

14 Design a built up column consisting of two channels back to back connected by lacing. The column carry an axial load of 800 kN (working). The column is fixed at both ends at an effective length of 5.5 m. Design the lacing also. Use Fe 410 grade steel. Use LSD.   10

15 Design a double angle strut for a roof truss to carry a factored load of 225 kN. Effective length of the strut is 2.8 m. The angles are placed on either side of gusset plate 12 mm thick. Use Fe 410 grade steel. Adopt limit state method.   10

16 Design a slab base for a column carry a working load of 800 kN, the column consist of ISMB 350. Ends of column are not machined for bearing. Use Fe 410 grade steel and M20 grade concrete for base. Adopt limit state method.   10

17 Write short notes on the following: 10
    a) Column splicing
    b) Block shear
    c) Plastic section, compact section and semi-compact section.

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FACULTY OF ENGINEERING
B.E 3/4 (Civil) II – Semester (Old) Examination, December, 2017
Subject : Steel Structures

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

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

Part – A (25 MARKS)

1. Write about web crippling and web buckling.   3
2. Calculate permissible stress in compression f_{ed} for a Column of slenderness ratio 120 and grade B.   3
3. Determine ultimate tensile strength F_u and yield strength F_y for grade 8.6 bolts.   3
4. List different types of tension members commonly used.   3
5. What is the check required for members subjected to bending about two mutually perpendicular axes.   3
6. Calculate throat thickness for a weld of size 8mm explain with the help of sketch.   2
7. What is the design criterion for a lacing member?   2
8. List three types of trusses with sketches.   2
9. Explain about load bearing stiffeners and intermediate web stiffener.   2
10. Explain design procedure of principal rafter.   2

Part – B (5x10 = 50 Marks)

11. Design a double cover single bolted butt joint to carry a tensile force of 400 K_N (working) The plates to be connected are 12mm thick use limit state design, adopt M 20 grade 4.6 bolts. Draw neat sketch showing sectional details.   10
12. A steel flat 100 mm x 10mm in cross section is used as a tension member. Determine the load carrying capacity if M $_{20}$ grade 4.6 bolts are used for connection as shown.   10
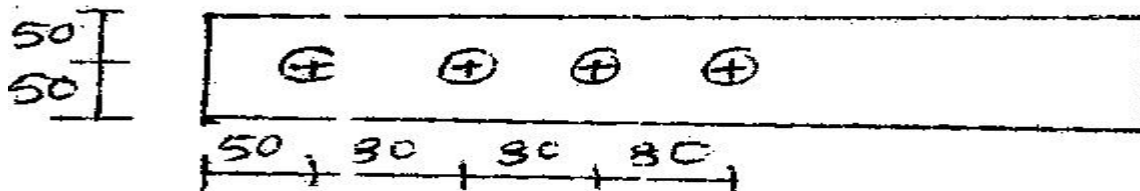
LACED

13. Design a Laced built up column consisting of two channels back to back, it carries a working load of 800 kN and has an unsupported length of 4.5m. Both the ends are restrained against translation and rotation.   10

14. Design suitable splicing for a column carrying a factored axial load of 600kN and a sheer force of 100kN. Use limit state method, Adopt Fe 410 grade steel.   10

15. A simply supported steel beam is subjected span to a total udl of 65 kN/m (factored) effective span of the beam is 7.8m and it is laterally supported. design the beam, use LSD.　　　　10

16. Design and I section Purlin for a roof truss, the trusses are spaced at 5m c/c and spacing between the purling is 2.2 m c/c. The roof covering is subjected to a wind pressure of 4 kN/m^2 and self weight of sheets, Purlin and fixers is 2 kN/m^2. Pitch of the truss is ¼　　　　10

17 Write short notes on:　　　　10
    a) Classification of section as per IS 800 - 2007
    b) Working stress method of design
    c) Guide line for bolted connection as per code provisions

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FACULTY OF ENGINEERING
B.E. 3/4 (EEE) II - Semester (New) (Suppl) Examination, December 2017
Subject: Electrical Machinery - III

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 methods to eliminate or suppress tooth harmonics?   3
2. What is Fractional Pitch and Fractional slot winding   2
3. Why EMF method of finding regulation is said to be pessimistic?   2
4. State the necessary conditions for parallel operation of two alternators?   3
5. What is synchronizing power for a salient pole motor, neglecting the armature resistance?   3
6. What is a synchronous condenser? Where is it used?   2
7. Explain transient stability in synchronous motor?   3
8. Write the applications of hysteresis motor?   2
9. Draw the characteristic of a stepper motor showing the relation between torque and pulses applied to the motor.   3
10. What are the advantages and disadvantages of linear induction motors?   2

PAR – B (50 Marks)

11. A 3 - Φ star connected alternators has open circuit line voltages of 6600V. The armature resistance and synchronous reactance are 0.6Ω / phase and 6Ω / phase respectively. Find terminal voltage, voltage regulation, and u (load angle) if load current is 180A at a power factor of (i) 0.9 lagging and (ii) 0.8 leading.   10

12. a) Explain two reaction theory of salient pole alternator?   5
     b) Explain the effect of change of excitation when two alternators are operating in parallel?   5

13. Discuss in detail different methods of determining regulation of synchronous generator?   10

14. a) What are the starting methods of a synchronous motor? Describe in detail   5
     b) Explain 'V' curves & inverted 'V' curves?   5

15. a) Discuss the stability of synchronous machine connected to infinite Bus bars   5
     b) Explain the working principle of Variable Reluctance motor and give its applications?   5

16. Explain in detail construction, operation, Characteristics of two – phase servomotor?   10

17. Write short notes on: 10
     a) AC series Motor
     b) Shaded pole motor

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FACULTY OF ENGINEERING

BE 3/4 (EEE) II Semester (Old) Examination, December 2017
Subject: Electrical Machinery – III

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 short circuit ratio and write its importance.	3
2. What is fractional pitch winding and fractional slot winding?	2
3. Why open circuit characteristics of synchronous machines has curved shape and short circuit characteristics is a straight line?	3
4 State the necessary conditions for parallel operation of two alternators	3
5 What is meant by "Hunting"? How is it prevented?	2
6 What are inverted 'V' curves?	2
7 What do you understand by positive sequence and negative sequence reactance of synchronous machine?	3
8 Draw the characteristics of AC servomotors	2
9 Write the applications of Linear Induction Motors?	2
10 What compensation is done in AC series motors? And why?	3

PART – B (50 MARKS)

11 a) Derive the formulas for finding the breadth factor and coil span   5
        factor for the fundamental component of induced emf.

   b) Find the distribution factor for a 36 slot, 4 pole, single layer, 3-phase   5
        winding.

12 A 3 phase, star connected, 1000 kVA, 11000 V alternator has rated current   10
   of 52.5A. The effective resistance of the winding per phase is $0.45\,\Omega$.
   The O.C and S.C tests on this machine gave the following results.
   O.C. test: Field current = 12.5 A, voltage between lines 422 volts.
   S.C. test: Field current = 12.5 A, line current = 52.5 A. Find the full load
   voltage regulation at (a) 0.8 pf lagging and (b) 0.8 pf leading.

13 a) Explain two-reaction theory of salient pole alternator.   5

   b) Explain the effect of change of excitation when two alternators are   5
        operating in parallel.

14 Describe the working principle and applications of   5+5

   a) Variable reluctance motor

   b) Hysteresis motor

15 a) Explain the different starting methods of synchronous motors   5

   b) What is the effect of varying excitation on armature current and power factor in synchronous motors?

16 a) Discuss the stability of synchronous machine connected to infinite bus-bar   5

   b) Explain the operation of two-phase serromotor   5

17 Write short notes on: 5+5
   i) Split phase single phase motors
   ii) Repulsion motor

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FACULTY OF ENGINEERING
B.E. 3/4 (Inst.) II - Semester (New) (Suppl) Examination, December 2017
Subject: Process Control

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 Process Variable?   2
2. What are Dead Time and Process Degree of Freedom?   3
3. Describe the Anticipatory Controller Mode.   2
4. Mention any three Electronic Controllers.   3
5. Integral action reduces _____in the Process.   2
6. What is Thermal element Lag?   2
7. Explain Pneumatic Valve Accessories.   3
8. What is Solenoid Valve?   3
9. Explain the Advantages of PLC.   2
10. Write the Ladder Logic for "OR" Gate.   3

PAR – B (50 Marks)

11. a) Calculate the resistance of Flow metering device whose flow Characteristics are related by $q = h^n$.   5
    b) With a neat diagram explain the Thermal Processes.   5

12. a) Explain Proportional Integral Controller Mode.   5
    b) In a Integral controller with reset time set to 0.6 minutes. What will be the phase of controller output for sinusoidal deviations?   5

13. a) With a block Diagram explain Two Position Controller.   5
    b) With a Schematics diagram explain single speed floating control.   5

14. a) Explain Control Valve Sizing and Selection.   5
    b) With a neat diagram explain the Characteristic Hydraulic Actuator.   5

15. a) Explain the Programming Pattern of PLC with suitable examples.   5
    b) What is a Ladder diagram? Explain with two examples.   5

16. a) With a neat diagram explain PLC operations.   5
    b) With a neat diagram explain Liquid Processes.   5

17. Write short notes on
    a) Elements of Process Dynamics   4
    b) PID Controller   3
    c) Valve Limit Switches   3

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FACULTY OF ENGINEERING
B.E. 3/4 (Inst.) II - Semester (Old) Examination, December 2017
Subject: Process Control

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 term process variables.   2

2. Explain flow process.   3

3. With an example, explain the action of automatic controller.   3

4. List the disadvantages of derivative controller.   2

5. Define static error and velocity error.   3

6. With a circuit diagram explain relay controller.   3

7. Describe pneumatic valve positioned.   2

8. What is the function of actuator in final control analysis?   3

9. Draw the ladder logic for OR Gate.   2

10. What are the various advantages of PLC?   2

PART – B (50 Marks)

11. a) With a schematic diagram, explain Thermal Process.   5

    b) Explain the elements of Process Dynamics.   5

12. a) Explain P + I controller and also obtain it's electronic implementation.   5

    b) With a block diagram, explain On-Off controller.   5

13. What is meant by tuning of controller? Explain Ziegler Nichol Tuning methods for
    controller setting.   10

14. a) With a schematics diagram explain Hydraulic Actuators.   5

    b) Explain control valve sizing and selection.   5

15. a) With a neat diagram explain PLC operation.   5

    b) What is a Ladder diagram? Explain with few examples.   5

16. a) Compare Proportional, Integral and Derivative controllers.   5

    b) Explain the programming pattern of PLC with any suitable illustration.   5

17. Write a short note on.

    a) Electronic controllers.   3

    b) Valve limit switches.   3

    c) Liquid Process and Dead time.   4

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FACULTY OF ENGINEERING
B.E. 3/4 (ECE) II-Semester (NEW) (Suppl) Examination, December 2017
Subject: Digital Signal Processing

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

Note: Answer All Questions From Part–A, any FIVE Questions From Part-B

PART – A

1. Distinguish between DIT-FFT and DIF-FFT   (2M)
2. State any three properties of DFT   (3M)
3. Find the DFT of x[n]={1,2,2,1} using DIT-FFT algorithm   (3M)
4. Give the applications of multirate signal processing   (3M)
5. Write the characteristic features of rectangular window   (2M)
6. Give the expression for the frequency response of
   (a) Hanning window (b) Hamming window.   (2M)
7. What is the difference between Von Neumann and Harvard architecture   (3M)
8. List any 3 arithmetic instructions of TMS320C54XX processors.   (3M)
9. Define sub band coding   (2M)
10. What are the advantages of bilinear transformation?   (2M)

PART – B

11. Determine the 8-point DFT of the sequence x(n)={1,2,1,3,5,4,0,2}   (10M)

12. Determine IFFT using DIT method for X(K)={2,-6,3,-2,9,0,0,7}   (10M)

13. Design a butterworth IIR lowpass filter with the following specifications: passband Ripple α_p=1dB, stopband attenuation α_s=40dB, passband edge frequency is 2000Hz, stop band edge frequency is 10000Hz, and sampling frequency is 25000Hz using bilinear transformation technique.   (10M)

14. Design an ideal HPF whose desired frequency response is

$H_d(e^{j\omega}) = 1$; $\pi \geq |\omega| \geq \dfrac{\pi}{3}$
$\quad\quad\quad = 0$;   otherwise
Using Bartlett window for N=9.   (10M)

15. (a) What is interpolation and decimation   (4M)

   (b) Consider a discrete time signal given by x(n)={1,3,2,5,6,4}. Determine the down sampled version of the signal for the sampling rate reduction factor, D=2. (4M)

   (c) What is the need for anti-aliasing filter prior to down sampling?   (2M)

16. Explain various CPU components of TMS320C54xx processor with the help of a neat diagram.   (10M)

17. Write short notes on
   (a) Properties of Twiddle factor.   (2M)
   (b) Finite word length effects   (4M)
   (c) Warping effect   (4M)

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FACULTY OF ENGINEERING
B.E. 3/4 (ECE II - Semester (Old) Examination, December 2017
Subject: Digital Signal Processing

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. Compare linear convolution and circular convolution   3
2. What is meant by in place computation?   2
3. List the key features of FIR filters   3
4. Define Gibbs phenomenon   2
5. Obtain the direct form –I realization for the system
   $Y(n) = =0.1Y(n-1)+0.2y(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2)$ 3
6. What are the necessary requirements for converting a stable analog filter to a stable digital filter?   3
7. Explain the necessity of multirate signal processing   2
8. Explain how do you achieve a phase shifter by a fraction of a sample   2
9. Explain the need for RISC processors.   2
10. Explain the Special Addressing modes of DSP Processor   3

PART - B (50 Marks)

11. a) Find DFT of the sequence x (n) = {0, 1, 2, 3, 4, 5, 6, 7} using DIF FFT. Draw a neat flow graph indicating results of intermediate stages   7
    b) Describe in detail computational complexity of DFT   3

12. a) Design a FIR BPF for N = 11 whose specifications are as given below: 8
    $H (e^{j\omega}) = 1 \quad 2\pi/3 \geq \omega \leq \pi/3$;
    $= 0$ otherwise; Using Bartlett window.
    b) Explain how finite word length affects the performance of FIR digital filter   2

13. a) Design a digital chebyshev type - I BPF for the following specifications Using bilinear transformation method: 8
    $H (e^{j\omega}) = $ -3dB for $0.55 \pi \leq \omega \leq 0.65 \pi$;
    $H (e^{j\omega}) = $ -15dB for $0. \leq \omega \leq 0.1 \pi$ and $0.95 \pi \leq \omega \leq \pi$;
    b) Compare bilinear transformation and impulse invariant transformation   2

14. a) Derive and explain with the help of neat diagrams how interpolation by 'I' can be achieved   6
    b) What is the need for multistage implementation of sampling rate converters?   4

15. a) List out the contents of TMS320C54XX CPU and describe their functions in detail   7
    b) Explain how the rounding operation is carried out by the adder/multiplier units of TMS320C54XX   3

16. a) Compare the various window functions with respect to main lobe width, transition width and stopband attenuation   4
    b) Explain how sampling rate by an arbitrary factor be achieved   6

17. Write notes on the following:
    a) Quantization errors in FIR filter   4
    b) On – chip peripherals of TMS320C54XX   6

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FACULTY OF ENGINEERING

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

Subject: Metal cutting and machine tool Engineering

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

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

PART – A (10 x 2.5 = 25 Marks)

1. If you machine aluminium bar at high speed and low depth of cut, what type of chips are developed why?
2. What is end milling?
3. Write Taylor's modified tool life equation.
4. What is machinibility index?
5. Why do we require quick return mechanism?
6. What is eccentric turning?
7. State specification of grinding wheels
8.   What are the advantages of gear hobing?
9. Differentiate between jig and fixture.
10. State the applications of EDM

PART – B (10 x 5 = 50 Marks)

11. a) Explain single point cutting tool nomenclature using ASA
    b) Explain properties required for a cutting tool.

12. a) How do you estimate the temperature in cutting?
    b) What are properties required for cutting fluid? And mention any five cutting fluids

13. a) Explain various work holding devices in lathe.
    b) Differentiate between shaper and planner.

14. a) Explain lapping and buffing with a suitable example.
    b) Explain types of bonding grinding wheels.

15. a) Explain 3-2-1 location principle
    b) Explain the principle of operation of EBM with the a sketch, mention MRR empirical relation and applications.

16. a) Explain the importance of Merchant analysis in metal cutting.
    b) How do you estimate tool life in metal cutting? How cutting fluids helps in tool life?

17. Write short notes on:
    a) Jig boring
    b) Gear grinding
    c) End milling

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FACULTY OF ENGINEERING

BE. 3/4 (Mech) II – Semester (Old) Examination, December 2017
Subject: Metal Cutting and Machine Tool Engineering

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

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

PART – A (10 x 2.5 = 25 Marks)

1. Explain the terms Tumbling b) Buffing c) Burnishing

2. What are the advantages and disadvantages of LBM?

3. How Lapping and Honning differ?

4. What is point to point system with neat sketch?

5. What is Adaptive control?

6. Differentiate between Absolute system and Incremental system?

7. What is meant by degree of accuracy?

8. What are test charts and what information's they convey?

9. What is plate type jig?

10. a) List out the main parts of power press?
    b) The male member of the die assembly is called_____.

PART – B (10 x 5 = 50 Marks)

11. Derive Merchant's analysis of metal cutting derive the various forces.

12. a) Describe different tool wear with neat sketches.
    b) Derive and plot Taylor's tools like equation.

13. a) How does a Planner differ from a Shaper machine?
    b) What are the main Operations performed on a Planner machine?

14. A mild steel plate 400mmx 00xmm x 30mm is to be shaped along it's wider Face. The ratio of return time to cutting time is 2:3 and the feed per cycle is 2mm. Tool approach and the over travel. respectively are 50mm each. Sketch a suitable cutting speed and calculate the machining time required for machining the given plate with H.S.S. tools.

15. A cutting force of 500kgf is registered by a force dynamometer while boring a hole of 100 mm dia. Calculate the torque on machine spindle?

16. Write short notes on the following a) Drill and reamer holders b) a self – releasing tap holder c) self-operating die Head d) boring tools e) reaming tools.

17. What is a turret saddle? Describe its function briefly.

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FACULTY OF ENGINEERING

B.E. 3/4 (PROD) II – Semester (New) (supply) Examination, December 2017
Subject: Metal Casting and Welding

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 the properties required for a moulding sand.
2. What pressurized gating ratio?
3. List various casting testing methods.
4. When do you prefer shell moulding?
5. What is soldering? Mention few applications of soldering
6. What are the advantages friction welding?
7. Suggest a method to join two Aluminium plates
8. How do you estimate the weld ability of material?
9. What is thermoforming?
10. When do you prefer cruciform test for weld defects.

PART-B (50MARKS)
(Answer any 5 Question)

11 a) Explain induction furnace with the help of sketch
   b) Explain at least four pattern with simple sketches and mention their applications
12 a) What are the possible defects in casting and suggest remedies for them?
   b) Explain the principle for Co_2 moulding with the help of figure
13 a) Explain various types of flames in gas welding. How do you differentiate each one?
   b) Explain the principle of LBW and SMAW
14 a) Explain the heat affected zone for welding of stainless steel.
   b) Explain metallurgical aspects of low carbon steel
15 a) List the possible defects in welding and suggest remedies for them
   b) Explain the principle injection moulding and mention its applications
16 a) Suggest a method to join two dissimilar metals of circular cross section and explain the process in detail
   b) Explain various types of core used in casting
17 Write short notes on
   a) GMAW
   b) Extrusion

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FACULTY OF ENGINEERING

B.E. 3/4 (prod) II-Semester (Old) Examination, December 2017
Subject: Metal Casting And Welding

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

Note: Answer all questions from part – A & Any five questions from part - B

Paper – A

1. State four best sand properties of moulding for aluminium castings.
2. What are suitable pattern materials for Aluminium metal casting.
3. State four remedies for defects in non sand casting processes.
4. Give eight components manufactured by centrifugal castings process.
5. State five defects occurs arc welding processes.
6. Give eight components joined by solid state welding.
7. Define weldability of material
8. State the composition of stainless steel.
9. State five reasons for hot cracks in weld metal.
10. State five advantages of composite materials over the conventional materials.

PART-B

11. a) Describe the design of riser for ferrous castings of 20 kgs.

    b) Explain with neat sketch the method of continuous casting process.

12. a) Explain with neat sketch the shell moulding process and discuss its working

    b) Discuss the working of centrifugal casting with neat sketch.

13. A) Explain the working of plasma arc welding with neat sketch.

    b) State ten industrial applications of solid state welding.

14. a) State the five difficulties occurring while welding AL and stainless steels.

    b) Explain with neat sketch the working of resistance welding concept and its working with equipment used.

15. a) Explain the ring weldability test of weld joint with set up and outcome of the test.

    b) Explain manufacturing of composite materials.

16. a) Explain a testing technique employed to evaluated a casted ferrous components.

    b) Explain the working of Arc furnace with neat sketch.

17. a) State five differences between SAW and GTAW process of welding.

    b) Explain with neat sketch the thermo forming process

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FACULTY OF ENGINEERING

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

Subject: Performance and Testing of Automotive Vehicles

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 Aerodynamic lift?

2   Explain rear end geometry of a vehicle.

3   Explain camping force in clutch.

4   List out the parts of single plate clutch.

5   Explain SAE rating.

6   Will traffic conditions and load effects the fuel economy? How?

7   Draw the lay out of suspension system for two wheeler vehicles.

8   Explain the types of steering arrangements.

9   Explain the testing procedure for emissions.

10 Explain stopping distance in brakes.

PART – B (5x10 = 50 Marks)

11 Explain the following:
   a) Power for propulsion
   b) Draw bar pull.

12 a) How is rolling resistance related to vehicle speed?
   b) What is aerodynamic drag coefficient of a vehicle.

13 An automobile power unit gives a maximum torque of 13.56 NM. The clutch is of a single plate clutch having clutch lining of both sides of the plate disc. The co-efficient of friction is 0.3 and the maximum axial pressure is 8.20×10^4 Pa, and external radius of the friction surface is 1.25 times the internal radius. Calculate the total axial pressure that must be exerted by the clutch springs.

14 a) What are the factors that effect the performance of an engine?
   b) What are the factors that effect thermal efficiencies of the IC engines?

15 Explain briefly rack and pinion steering gear mechanism.

16 Explain the following:
   a) Cylinder leakage test
   b) Types of engine noise's

17 a) Draw and explain independent suspension system.
   b) Draw and explain centrifugal clutch.

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FACULTY OF ENGINEERING

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

Subject: Performance and Testing of Automotive Vehicles

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 traction.

2 List out the forces and movements acting on a car body.

3 Draw a single late clutch and name the parts.

4 List out the types of automatic gear boxes used for automobiles.

5 Explain vehicle safety.

6 Explain the types of steering gear boxes used in automobiles.

7 Draw any one independent type suspension system.

8 Explain testing of gear box.

9 Will vehicle condition, road condition and driving habits effects the fuel economy.

10 List any six engine testing noises.

PART – B (5x10 = 50 Marks)

11 a) Explain the term rolling resistance, drag resistance.   5
   b) What is aerodynamic drag coefficient of a vehicle?   5

12 Derive an expression for frictional torque acting on the ring of multiplate clutch.   10

13 Explain with a neat sketch of the following: 10
   a) Sliding mesh gear box
   b) Constant mesh gear box

14 a) Explain engine rating and explain SAE, DIN, PAC rating.   5
   b) Explain: 5
      i)   Valve resistance
      ii) Combustion time
      iii) Residual gas

15 a) Draw and explain stabilizer bar.   4
   b) Explain hydraulic braking system with a neat sketch.   6

16 Explain with neat sketch effects of body roll and irregular road surface on suspension.   10

17 Explain the following:
   a) Braking testing procedure
   b) Engine testing procedure
   c) Suspension testing procedure.

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FACULTY OF ENGINEERING

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

Subject: Design & Analysis of Algorithms

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	Why an algorithm analysis required?	2
2	State about 'union' and 'find' operations.	2
3	Define feasible solution w.r.t greedy knapsack problem.	3
4	Compare Quick sort Vs Merge sort.	3
5	What is a Bi-connected components.	2
6	State 4 queens problem.	3
7	Write an algorithm for finding minimum element in a list of elements.	3
8	Write about Least Count Search.	2
9	Define Chromatic Number.	2
10	Discuss Clique Decision Problem.	3

PART – B (5x10 = 50 Marks)

11 Explain step by step heap sort with example and write an algorithm for heap sort.   10

12 a) Explain about Huffman codes.   5

b) Find feasible solution for given jobs with deadlines,
n=7, (p1, p2 … p7)=(3,5,20,18,1,6,30), 9d1, d2 … d7) = (1,3,4,3,2,1,2).   5

13 Explain about all pairs shortest path problem with an example and write algorithm.   10

14 Consider Travelling sales person instance   10

$$\begin{pmatrix} & 7 & 3 & 12 & 8 \\ 3 & & 6 & 14 & 9 \\ 5 & 8 & & 6 & 18 \\ 9 & 3 & 5 & & 11 \\ 18 & 14 & 9 & 8 & \end{pmatrix}$$

Obtain the state space tree that is generated by LCBB.

15 Explain about NP-Hard scheduling problems. 10

16 Construct Optimal Binary Search Tree and Compute w(i, j), r(i, j), c(i, j), 0<=i,j, j<=4, for the identifier set (a1, a2, a3, a4) = (count, float, ifr, while) with p(1)=1/20, p(2)=1/5, p(3)=1/10, p(4)=1/20, q(0)=1/5, q(1)=1/10, q(2)=1/5, q(3)=1/20, q(4)=1/20. 10

17 Explain about DFS with example. Write algorithm and its time complexity. 10

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FACULTY OF ENGINEERING

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

Subject: Principles of Programming Languages

Time: 3 Hours   Max.Marks: 75

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

PART – A (25 Marks)

1	Draw the syntax tree for a+b*c/d-e*f-g.	3
2	What is the purpose of complier symbol table?	2
3	What is a dangling reference? How do you handle dangling else in C language?	3
4	Give an example of a language that supports non-determinacy.	2
5	Differentiate between type casting and type coercion.	3
6	What is an activation record? Give an example.	2
7	How do you implement serializibility in Java?	3
8	What is dynamic method binding?	2
9	Differentiate between Inspection and Introspection.	3
10	What are higher order functions?	2

PART – B (5x10 = 50 Marks)

11	Write the BNF syntax for case statement in "C" language.	10
12	Explain in detail about control flow mechanism with example.	10
13	Describe any four parameter passing mechanisms in detail.	10
14	Explain different object oriented programming language aspects with an example.	10
15 a)	Explain the behaviour of Cut operator. Give the differences between Red and Green cut.	5
b)	Briefly explain the features of LISP language.	5
16 a)	Write short notes on polymorphism and encapsulation.	5
b)	Use an example to explain any two expression evaluation.	5
17 a)	Explain differences between Compilation and Interpretation.	5
b)	Explain different types of pointers.	5

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FACULTY OF ENGINEERING

BE. 3/4 (I.T) II – Semester (New) (Suppl) Examination, December 2017

Subject: Data Warehousing and Data Mining

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 different types of attributes? Give examples.   (3)
2. What is the need for preprocessing of data?   (3)
3. What is a data warehouse?   (2)
4. Define the following i) Market basket analysis   ii) Strong association rule.   (2)
5. Which of the two algorithms for frequent itemset generation(Apriori and FP-growth)   (3)
    is efficient?Justify your answer.
6. Define a Bayesian belief network. Give an example.   (3)
7. Clustering is a form of unsupervised learning. Justify the statement.   (2)
8. What is the difference between noise and an outlier?   (3)
9. Differentiate lazy learners and eager learners.   (2)
10. Define multimedia data mining.   (2)

Part-B(75 Marks)

11. a) Explain various data cleaning methods with examples.   (7)
    b) What are the applications of data mining?   (3)
12. a) Explain the star schema of a data warehouse.   (5)
    b) Write the differences between OLAP aand OLTP systems.   (5)
13. Write and explain the algorithm for mining frequent itemsets using candidate generation.   (10)
14. a) Explain classification by backpropagation.   (6)
    b) Explain how do you measure the accuracy of a classifier.   (4)
15. a) Write and explain k-means clustering algorithm. Give an example.   (7)
    b) What is a dendrogram? Give an example.   (3)
16. a) Explain the attribute selection measures in decision tree induction.   (7)
    b) Write short notes on SVM classification.   (3)
17. Write short notes on the following.
    a) Spatial Data mining   (5)
    b) Web mining   (5)

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FACULTY OF INFORMATICS

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

Subject : Design and Analysis of Algorithms
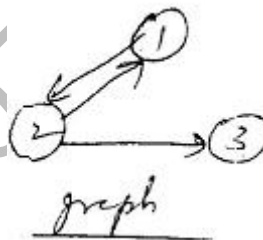
Time : 3 hours   **Max. Marks : 75**

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

PART – A (25 Marks)

1 Analyse the performance of the following algorithm.   3
  Algorithm A( )
  {
    int i, j ;
    for (i = 1 to n) do
    for (j = 1 to n) do
     printf ("Hi")
  }

2 Solve the recurrence relation $T(n) = 4T(n/2) + n^2$.   3

3 Represent the following graph using adjacency list.   2

graph

4 Describe the greedy method.   2
5 Write short notes on minimum spanning tree.   2
6 What is dynamic programming? List out any two problems addressed by dynamic programming.   3
7 Illustrate DFS with an example.   3
8 Explain briefly branch-and-bound method.   3
9 Show the relationship among P, NP, NP-complete and NP-hard problems using Venn diagram.   2
10 Describe the halting problem.   2

PART – B (50 Marks)

11 a) Consider the following three disjoint sets
   $S_1 = \{1, 7, 8, 9\}$, $S_2 = \{2, 5, 10\}$ and $S_3 = \{3, 4, 6\}$
   i) Represent the sets as tree   3
   ii) Perform union operation   3
   b) Write about the cost amortization.   4

12 Consider the elements : 310, 285, 179, 652, 351, 423, 861, 254, 450, 520
   a) Execute merge sort algorithm and show each step   7
   b) Analyse the time complexity of merge sort.   3

13 a) Consider the following instance of knapsack problem. 5
    $n = 3, m = 20$
    $(P_1, P_2, P_3) = (25, 24, 13)$
    $(W_1, W_2, W_3) = (18, 15, 10)$
    Find the optimal solution using greedy method.
  b) Let $n = 4$, $(P_1, P_2, P_3, P_4) = (100, 10, 15, 27)$ and
        $(d_1, d_2, d_3, d_4) = (2, 1, 2, 1)$
    Find the optimal solution for job sequence using greedy method. 5

14 Consider the following graph.
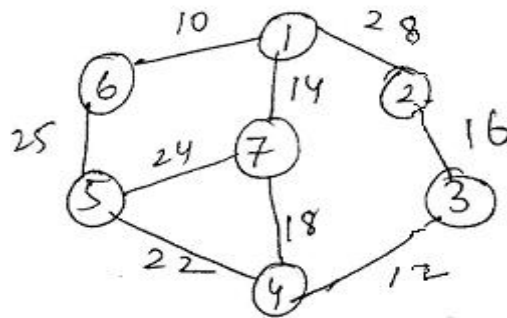
  a) Find MST using Kruskal's algorithm. 5
  b) Find MST using Prims algorithm 5

15 a) Explain the travelling salesman problem with an example. 5
  b) How to find articulation point and bi-connected components from the following graph. 5

.Graph
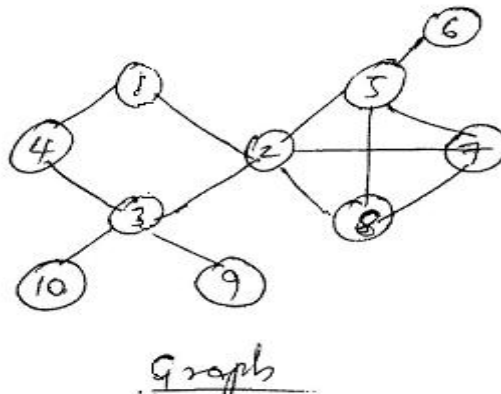
16 a) Explain the solution to the 4-queens problem using backtrackling. 5
  b) Write about the Hamiltonian cycle with an example. 5

17 a) Explain the NP-hard scheduling problems. 4
  b) Explain the Cook's theorem. 6

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