Code No: 11372

FACULTY OF ENGINEERING

B.E. I-Semester (CBCS) (Backlog) Examination, November / December 2018

Subject: Engineering Physics - I

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

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

PART-A (2x10 =20 Marks)

1. What are the conditions required for interference of light?
2. Give the differences between interference and diffraction.
3. Explain the working of a Quarter wave plate?
4. Distinguish between spontaneous emission and stimulated emission.
5. Find the numerical aperture of a glass cladded fibre made with core glass of Refractive index 1.5 and cladding is doped to give a fractional index difference of 0.0005.
6. Explain the Kundt's tube method of detecting ultrasonic waves.
7. What do you mean by canonical and grand canonical ensembles?
8. Give any four differences between MB and FD statistical distributions
9. Derive the expression for the de-Broglie wavelength of matter waves.
10. Describe the conduction and displacement currents.

Part-B (50 Marks)

11. Derive the expression for brightness and darkness for a monochromatic light beam reflected from a thin parallel film of transparent material. 10

12. (a) Define specific rotation and explain optical activity 3
    (b) Explain the construction and working of Laurent's half shade polarimeter 7

13. (a) What is an optical fibre? Explain the principle involved in working of optical fibre 3
    (b) Derive an expression for acceptance angle and numerical aperture for an optical fibre. 7

14. (a) Explain the terms Phase space and thermo dynamical probability. 4
    (b) On the basis of BE statistics, derive planck's law of black body radiation. 6

15. (a) Derive the time dependent Schrodinger wave equation for a particle in a potential V. 7
    (b) Calculate the energy required for an electron to jump from ground state to second excited state in a potential well of width L. 3

16. (a) Differentiate spontaneous and stimulated emission of radiation. 4
    (b) Explain with neat diagram the principle, construction and working of a semiconducting laser. 6

17. What is meant by Poynting vector? Derive poynting vector from Maxwell's equations and explain its physical significance. 10

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Code No. 11126

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II – Semester (Suppl.) Examination, November / December 2018

Subject: Steel Structures

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

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

PART – A (10 x 2.5 = 25 Marks)

1 Explain about stress concentration in rolled sections.
2 What shall be minimum and maximum pitch as per IS 800, what shall be edge and end distances.
3 Explain about block shear with the help of sketch.
4 Differentiate between laterally supported and laterally un-supported beams with the help of sketches.
5 How do you decide the size of a batten in built up columns using IS 800?
6 Write short notes on splicing of a compression member.
7 Explain how to calculate net area of a tension member connected by staggered pitch bolts.
8 What are the forces developed in eccentrically bolted connection, explain with the help of sketch.
9 What are the permissible slenderness ratios for tension members, compression members and members subjected to reversal of loads?
10 Calculate the slope of a roof truss if its pitch is 1 / 5 and span of the truss is 10 m.

PART – B (5x10 = 50 Marks)

11 Two steel plates 200mm wide and 10mm thick are connected by a lap joint. Design a single row chain bolting. The plate carry and axial load of 300 kN. Use Fe410 steel and grade 4.6, M18 bolts. Use limit state method.

12 A single angle tension member carry a factored load of 450 kN. Design the member if it is connected to the gusset plate through single row bolted connection. Adopt limit state method. Use Fe410 steel and grade 4.6 M20 bolts at a pitch of 70 mm.

13 A simply supported steel beam has an effective span of 7.2 m. It is subjected a working load of 30 kN/m, design the beam if it is laterally supported. Use limit state method.

14 A built up column consists of two channels back to back and carry a factored load of 1200 kN. Design the column, design suitable lacing. Effective column height is 6.2 m. Use Fe410 grade steel. Design by limit state method.

15 Design a slab base for steel column ISHB 300 at 588 N/m. The column carry a load of 800 kN. Permissible stress in concrete base is 6 N/mm^2. Use suitable steel and bolts.

16 Design a purlin for a factory building, if trusses are spaced at 6.5 m center to center and purlins are spaced at 2.6 m center to center. Pitch of the truss is ¼ and span of truss is 12 m. Dead load from sheets, purlins etc is 300 N/m^2 and wind load normal to the roof is 1750 N/m^2.

17 Write short notes on
a) Working stress and limit state method.
b) Web buckling
c) Stress concentration in rolled section.

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Code No. 11132

FACULTY OF ENGINEERING

B.E. 3/4 (EEE) II - Semester (Suppl.) Examination, November / December 2018

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 Explain why the speed of synchronous generators speed should be kept constant.
2 Differentiate between cylindrical and salient pole alternators.
3 Draw the phasor diagram of alternator at lagging p.f.
4 Explain the significance of Xd & Xq in salient pole alternators.
5 What happens when the excitation of D.C machine is changed ? Is the effect same in a synchronous motor ?
6 Sketch the waveform of symmetrical short circuit current for dead short circuit across the terminals of the alternator.
7 How does a single phase induction motor differs from three phase & why are single phase motors commonly used ?
8 What is synchronous condenser & what are its applications ?
9 What will happen if D.C series motor is connected to A.C supply?
10 What are the advantages & disadvantages of linear induction motors& give its applications ?

PART – B (50 Marks)

11 (a) What is armature reaction ? Explain the effect of armature reaction on the terminal voltage of alternator at a) UPF b) Zero lagging p.f load .Draw the relevant phasor diagrams.

(b) A three phase two pole synchronous generator has a frequency of 50Hz. The stator has 24 slots & a permissible current of 10A .The coil span is 11 slots.The flux /pole is 2 Wb . Find the EMF generated (line to neutral) & KVA capacity of the machine.

12 (a) For a salient pole synchronous machine derive an expression for power developed as a function of load angle .Neglect the effect of armature resistance

(b) An 11 KV 3 phase cylindrical rotor type alternator has the following open circuit characteristics at rated voltage :

Line Voltage :	7300	10300	12400	14000
Field Current :	40	60	80	100

The excitation to produce full load current on short circuit is 34A & when the machine supplies full load output at 11 KV & Zero power factor the excitation is 106A. Determine (a) % synchronous reactance drop (b) % leakage reactance drop (c) The armature reaction in equivalent field amperes at F.L

..2

13 (a) Explain the effect of change of load of synchronous motor on it's torque angle & Armature current.

(b) An industrial plant has a load of 800KW at 0.8p.f lag . It is required to install a synchronous motor to deliver a load of 200KW & improve the overall p.f of the plant to 0.92. Determine the KVA rating of the synchronous motor & its p.f .The efficiency of the motor is 90%.

14 The excitation of 415V 3 phase mesh connected synchronous motor is such that the induced EMF is 520V .The impedance per phase is (0.5+j4)Ω .If the friction & iron losses are constant at 1000W .Calculate the horse power output, line current, power factor ,efficiency for a) Maximum power output b) Maximum Power input.

15 (a) Explain the operation of capacitor start capacitor run induction motor & draw torque slip curves on the basis of double revolving theory.

(b) Write short notes on compensated series motors.

16 (a) Explain the method of synchronizing an alternator to infinite busbars.

(b) Write short notes on operation of switched reluctance motor & list its applications

17 (a) Two synchronous generators are connected to busbars having a constant voltage of 10,000 $\angle 0^o$ V. Generator A has an induced EMF of 13000 $\angle 22.6^0$V and a reactance of 2Ω. Generator B has an EMF of 12500 $\angle 36.9^0$V and a reactance of 3Ω. Find the current ,KW,KVAR supplied by each generator.

(b) A salient pole alternator has the following per unit parameters. Xd = 1.2, Xq = 0.8, Ra = 0.025. Compute the excitation voltage on per unit basis when the generator is delivering the rated kVA at rated voltage and a power factor of 0.8 lagging and 0.8 leading

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Code No. 11137

FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) II-Semester (Suppl.) Examination, November / December 2018

Subject : Process Control

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

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

PART – A (25 Marks)

1	What is Thermal Process?	2
2	Calculate the resistance of flow metering device whose flow characteristics are related by $q = h^n$.	3
3	Define Proportional Band.	2
4	With a neat diagram explain Automatic Controller.	3
5	What is Velocity Error?	2
6	Write the significance of Zeigler Nichols Method.	3
7	Find the flow rate q. If $C_v = 1$, $\Delta P = 25$psi and specific gravity of water = 1.	3
8	What is a Solenoid Valves?	2
9	Explain the advantages of PLC.	3
10	Write the Ladder Logic for "OR" gate.	2

PART – B (5 x 10 = 50 Marks)

11	a)	With a Physical Diagram explain the elements of Process Dynamics.	5
	b)	With a Schematic Diagram explain the Thermal Processes.	5
12	a)	Explain proportional Integral Controller Mode.	5
	b)	In an Integral controller with reset time set to 0.6 minutes. What will be the phase of controller output for sinusoidal deviations?	5
13	a)	Draw a block diagram and explain the two Position Controller.	5
	b)	Draw the Schematic diagram explain single speed floating control.	5
14	a)	Explain Control Valve Sizing and Selection.	5
	b)	With a neat diagram explain Pneumatic Actuators.	5
15	a)	With a block diagram explain various parts of PLC.	5
	b)	What is a Ladder diagram? Write the Ladder Logic for Traffic Light Signaling.	5
16	a)	With a neat diagram explain PLC operations.	5
	b)	A process Exhibit oscillations for a critical gain of 2 in a 30 minutes period. Find the setting of Zeigler-Nichol for P+I+D controller mode.	5
17	Write short notes on :		
	a)	Process Degree of Freedom	4
	b)	Valve Limit Switches	3
	c)	Liquid Processes	3

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Code No: 11141

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) II-Semester (Suppl.) Examination, November / December 2018

Subject: Digital Signal Processing

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

Note: Answer All Questions From Part–A. Answerany FIVE Questions FromPart-B

PART-A (25 Marks)

1. Compute the DFT of a sequence x(n)={1,-1,1,-1} using DIF algorithm (3M)
2. What are the advantages of FIR Filters (3M)
3. Distinguish between Butterworth and Chebyshev Type-1 filter (3M)
4. What are the properties of Butterworth filter (2M)
5. Give the equation specifying Bartlett and Hamming windows (2M)
6. What are the special features of digital signal processors? (3M)
7. What is warping effect (2M)
8. What is the modified Harvard architecture employed in Digital signal processor (3M)
9. Compare fixed point and floating point number representation (2M)
10. Briefly discuss the operation of CSSU in TMS 320C 54x processor (2M)

PART- B (50 Marks)

11. Compute circular convolution of the following two sequences using DFT
    $x_1(n)=\{0,1,0,1\}$ and $x_2(n)=\{1,2,1,2\}$ (10M)

12. Find the DFT of the following Discrete time sequence x(n)={2,1,4,1,3,2,2,3} using radix-2 DIF-FFT algorithm. (10M)

13.

14. Design a digital low pass Butterworth filter using bilinear transformation with T=1sec with the following specifications.
    $0.707 \le |H(e^{j\omega})| \le 1.0$; $0 \le \omega \le$
    $|H(e^{j\omega})| \le 0.2$; $\le \omega \le$ (10M)

14. Design an ideal LPF whose desired frequency response is
    $H_d(e^{j\omega}) = 1$; $\ge \omega \ge -$
    $= 0$; $\ge |\omega| \ge -$
    Using Rectangular window for N=9. (10M)

15. (a) What is the need for anti-imaging filter after upsampling a signal (2M)
    (b) Show that decimator is a linear system (3M)
    (c) Explain about finite word length effects (5M)

16. a)Draw the architecture of TMS320C54XX processor (4M)
    (b)Explain the addressing modes of TMS320C54XX processor (4M)
    (c)Explain any two data transfer instructions of TMS320C54XX processor (2M)

17. (a) Compare IIR and FIR filters (4M)
    (b) RISC Vs CISC CPU (3M)
    (c) Advantages of FFT algorithm (3M)

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Code No. 11145

FACULTY OF ENGINEERING

B.E. 3/4 (Mech) II-Semester (Suppl) Examination, November / December 2018

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. Differentiate between oblique cutting and orthogonal cutting.
2. When do you select CBN as cutting tool?
3. State Taylor's tool life equation.
4. Mention the properties of cutting fluid.
5. State the various taper turning methods.
6. Write the specification of a lathe.
7. Mention the applications of burnishing.
8. What do you understand from thread chasers?
9. State the design principles of location.
10. Write the application of ECM.

PART – B (10 x 5 = 50 Marks)

11. a) Explain drill bit nomenclature with the help of simple sketch.
    b) Explain with near sketch to measure temperature of the cutting tools.

12. a) Explain Economics of production for minimum cost.
    b) Explain various stages of tool wear.

13. a) sketch the milting cutter geometry for up milling and name the parts
    b) Differentiate between Capstone and Turret lathe.

14. a) Explain working principle of centre less grinding
    b) Explain principle of gear shaving

15. a) Explain box jig and indexing jig
    b) Explain the principle of operation of USM with the a sketch, mention MRR empirical relation and applications

16. a) Explain the properties required for cutting tool and mention at least 5 tool materials.
    b) Explain sources of heat generation during cutting.

17. write short notes on
    a) Quick return Mechanism b) AJM c) clamping

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Code No. 11151

FACULTY OF ENGINEERING

B.E. 3/4 (PROD) II-Semester (supply) Examination, November / December 2018

Subject: Metal Casting and Welding

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

Note: Answer all Questions Each Question carries equal marks)

PART – A (25 Marks)

1. What is the purpose of core and core prints?
2. State and explain the Sivert's law of gas absorption
3. State the methods of inspecting fine surface defects in the casting. Explain any of them in brief
4. State the causes and remedies of hot cracks in the casting
5. What are the merits of laser beam welding over electron beam welding?
6. What are the differences between TIG and MIG welding processes?
7. What is the principle of resistance welding? Why does the melting in spot welding take place at the interface between two sheets?
8. State the influence of thermal conductivity of the material on the weld ability
9. State few applications of thermosetting plastics
10. What is the principle of blow moulding and state its applications.

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

11 a) What are various materials used for pattern making? Compare their merits and demerits

b) State and explain the types of gates used in casting process. Compare their relative merits and demerits.

12 a) Explain the shell moulding process with a neat sketch

b) State the types of centrifugal casting and explain any one of them with a neat sketch

13 a) Explain the process of friction welding with its relative merits and demerits.

b) Explain the electros lag welding process with a neat sketch

14 a) Explain process of resistance spot welding and state how resistance projection welding differs from the resistance spot welding.

b) State and explain the welding aspects aluminium alloys

15 a) What are the plastic products those can be manufactured by extrusion process? Explain the process with a neat sketch

b) State and explain the types of composite materials and also state the merits and demerits of composites compared to monolithic materials

16 Explain the following briefly

a) NRL of riser design (3)

b) Co_2 Moulding (3)

c) Forge welding (4)

17 Explain the following briefly

a) Resistant Seam welding (3)

b) Thermoforming (3)

c) MEMS (4)

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Code No: 11154

FACULTY OF ENGINEERING

BE 3/4 (AE) II-Semester (Suppl.) Examination, November / December 2018

Subject : Performance and Testing of Automotive Vehicles

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

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

PART-A (2 ½ x 10 = 25 Marks)

1. What vehicle drag?
2. Does power for propulsion depord upon gross vehicle weight?
3. What are the requirements of a clutch.
4. What is free wheel?
5. Explain RAC Rating
6. State Various Efficiencies
7. What are the steering troubles and their causes?
8. Sketch the shoe mounting in an internal expanding brakes?
9. How to calculate the stoping distance of a vehicle?
10. Explain the ignition timing testing.

PART-B (50Marks)

11. Explain Briefly types of forces moments and resistances acting on a vehicle with neat diagram for each.

12. A multiple disc clutch has five plates having four pairs of active friction surfaces. If the intensity of pressure is not to exceed 0.127 N/mm2, find the power transmitted at 500rpm. The outer and inner radii of friction surfaces are 125mm and 75mm respectively assume uniform wear and take coefficient of friction = 0.3

13. Explain Briefly the working principle of constant mesh gearbox and explain how to calculate the gear Ratios for 1^{st} 2^{nd} 3^{rd} and Reversegear Ratio with the help of neat sketch.

14 Explain the following:
   i) DIN Rating
   ii) IHP,BHP
   iii) Volumetric Efficiency

15 Explain Briefly Vehicle testing on Road and Track Testing

16 a) What are the factors that effect thermal efficiencies of the I.C engine?
   b) Explain Rack and pinion steering gear mechanism

17 Explain the mechanics of hydraulic single-line braking system with the help of neat sketch.

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Code No. 11161

FACULTY OF INFORMATICS

B.E. 3/4 (CSE) II – Semester (Suppl.) Examination, Nov. / Dec. 2018

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.

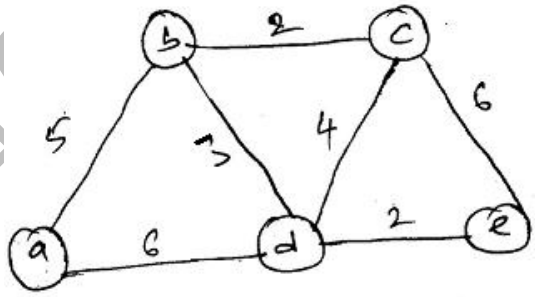
PART – A (25 Marks)

1 Analyse the time complexity when 2 (mxn) matrices are added. 3
2 Define Big-oh notation. 2
3 What do you mean by job sequencing with deadlines? 2
4 Write control abstraction for the divide and conquer paradigm. 2
5 Differentiate between DFS and BFS. 3
6 How to find biconnected components and how are they useful? 3
7 What is an articulation point in a graph? 2
8 Draw a graph with a cycle but not Hamiltonian cycle. 3
9 An NP-Hard problem can be solved in deterministic polynomial time. How? 3
10 List features of prolog. 2

PART – B (5x10 = 50 Marks)

11 a) Define recurrence relation and explain how recurrence relations are solved with suitable example. 5
b) What is Hashing? Give various techniques of it. Discuss with examples. 5

12 a) Write about merge sort and arrange the numbers in sorted order {18, 29, 68, 32, 43, 37, 87, 24, 47, 50}. Derive its time complexity. 6
b) Apply Kruskal's algorithm to find minimum spanning tree for following graph. 4



13 Use function OBST to computes w(i, j), r(i, j) and c(i, j) $0 \le i \le j \le 4$ for the identifies set (a_1, a_2, a_3, a_4) = (cout, float, if, 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 construct the optimal binary search tree. 10

14 Write an algorithm for N-Qeen's problem and trace it for n=6. 10

15 a) Write about NP-Hard and NP-Completeness problems. 5
b) Explain Cook's theorem. 5

16 Describe all-pairs shortest path problem and write procedure to compute lengths of shortest paths. 10

17 Write a complete LC branch and bound algorithm for traveling sales person problem. 10

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Code No. 11166

FACULTY OF ENGINEERING

BE. 3/4 (I.T) II-Semester (Suppl.) Examination, November / December 2018

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 is data mining? (2)
2. Define cosine similarity. (2)
3. What do you mean by facts and dimensions in a data warehouse schema? (2)
4. State the Apriori principle. (2)
5. Define support and confidence of an association rule. (2)
6. Explain confusion matrix with an example. (3)
7. When does a class-imbalance problem occur? How do you overcome it? (3)
8. Differentiate single linkage and complete linkage in hierarchical clustering. (3)
9. What is an outlier? What are the types of outliers? (3)
10. Write briefly about spatial data mining. (3)

Part - B (50 Marks)

11. a) What are the major issues in data mining? (5)
    b) What are the major tasks in data preprocessing? (5)

12. a) Explain the architecture of a data warehouse. (6)
    b) Define enterprise warehouse, data mart and virtual warehouse. (4)

13. Explain the FP-growth algorithm for mining frequent itemsets with an example. (10)

14. Explain the decision tree induction algorithm with an example for classification. (10)

15. a) What are the requirements for cluster analysis? (5)
    b) Explain k-medoids clustering algorithm. (5)

16. a) What are the challenges of outlier detection? (5)
    b) What are the measures of accessing clustering quality? Explain. (5)

17. Write short notes on the following.
    a) KDD process (5)
    b) Text mining (5)

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