

FACULTY OF ENGINEERING

B.E. II - Semester (Annual) Examination, December 2017

Subject: Engineering Mathematics - II

Time: 3 Hours

Max. Marks: 70

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

PART-A (20 Marks)

1. Solve $(x^2 + y^2 + x) dx + xy dy = 0$
2. Solve $x \frac{dy}{dx} + 2y - x^2 \log x = 0$.
3. Solve $(D^4 - 5D^2 - 36) y = 0$.
4. Find the particular integral of $(D^2 + 4D + 4)y = e^{-2x}$.
5. Determine the nature of the singular point of the differential equation $x^2 y'' - 5y' + 3x^2 y = 0$
6. Evaluate $4 P_3(x) + 6P_2(x) + 3 P_1(x)$ as a polynomial of x .
7. Evaluate $\int_0^{\infty} x^{1/3} e^{-x^2} dx$
8. Evaluate $\int_0^n x^n (1 - \frac{x}{m})^{m-1} dx$ in terms of beta function where $m, n \in \mathbb{N}$.
9. Find $L \{ e^{-2t} (\cos 3t - \sin 3t) \}$
10. Find $L^{-1} \{ \frac{3s+2}{(s+1)^3} \}$

PART - B (50 Marks)

11. a) Solve $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$
 b) Find the Orthogonal trajectories of the Family of hypocycloids $x^{2/3} + y^{2/3} = a^{2/3}$ where 'a' is parameter
12. a) Solve $(D^2 - 4D + 3)y = 3 e^x \cos 2x$.
 b) Solve $(x^2 D^2 + xD - 1)y = x^3$
- 13 Find the Frobenius Series solution about $x = 0$, of the equation $4x^2 y'' - 8xy' + 5y = 0$
14. a) Show that $\frac{d}{dx} \{ \text{erf} (\alpha x) \} = \frac{2\alpha}{\sqrt{\pi}} e^{-\alpha^2 x^2}$
 b) Show that $J_2'(x) = (1 - \frac{4}{x^2})J_1(x) + \frac{2}{x} J_0(x)$

15.a) Evaluate $L \left\{ \frac{\cos at - \cos bt}{t} \right\}$

b) Evaluate $L^{-1} \left\{ \frac{s}{(s-3)(s^2+4)} \right\}$

16 a) Find the general solution of the equation $y' = 3y^2 - (1+6x)y + 3x^2 + x + 1$, if $y = x$ is a particular solution.

b) Solve $(D^2 - 2D) y = e^x \sin x$ by the method of variation of parameters.

17. a) Show that $n.p_n(x) = x.p'_n - p'_{n-1}(x)$

b) Solve $y'' + 3y' + 2y = 3$, $y(0) = 1$, $y'(0) = 1$ by applying the Laplace transform.

FACULTY OF ENGINEERING

B.E 2/4 (CE/ECE/AE/CSE) II – Sem (Suppl) Examination, December, 2017

Subject : Environmental studies

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 habitat. Give two examples. Define threatened and endangered species (3)
2. Write about the biotic and a biotic components of an ecosystem (2)
3. Give an account of consumptive and productive used of biodiversity. (3)
4. In nature grazing and detritus food chains are operated simultaneously, explain. (2)
5. What is the relevance of social issues and the environment? (3)
6. What are point and non point sources of water pollution? (2)
7. Discuss the causes of soil pollution. (2)
8. Discuss the impacts of population on sustainable ecosystem. (3)
9. What are the causes and effects of acid rain? (3)
10. Enumerate various causes of water pollution (2)

PART - B (50 Marks)

11. a) Explain the importance of natural resources in environmental studies. (5)
b) Discuss the impacts of modern agricultural practices. (5)
12. a) Explain the structural and functional aspects of an ecosystem. (5)
b) Explain the ecological pyramids with the help of a neat diagram. (5)
13. a) Discuss the need of protecting biodiversity on earth. (4)
b) Explain the major causes responsible for the loss of biodiversity and inset conservation approaches for protecting biodiversity. (6)
14. a) Give a comparative account of urban and industrial wastes in terms of their sources characteristics, management and disposal methods (6)
b) Discuss the issues involved in the enforcement of environmental legislation. (4)
15. a) Define disaster management. Explain the causes, impacts and mitigation measures for earthquakes. (5)
b) Outline the impacts of disasters on infrastructure and development. (5)
16. Explain the following
a). Environmental ethics (2)
b). Causes and impacts of deforestation (4)
c). Environmental protection act (4)
17. a) Explain the causes and mechanism of Ozone layer depletion. (5)
b) Write a detailed note on watershed management (5)

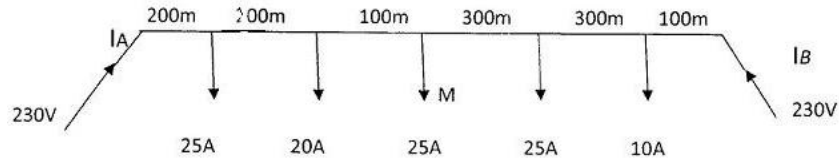
FACULTY OF ENGINEERING**B.E. 2/4 (EEE) II - Semester (Suppl) Examination, December 2017****Subject: Power systems -I****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part - A and any five questions from Part - B.****PART-A (25 Marks)**

1. Explain about self GMD & mutual GMD (3)
2. Explain skin effect (3)
3. What do you mean by transposition of lines? (2)
4. What are the essential components of a flat plate collector? (2)
5. What are the advantages of ring – main system?. (3)
6. What are the non. Conventional sources? (2)
7. Estimate the power generated if a river has a discharge of $6000\text{m}^3 / \text{sec}$ with a head of 20m, the overall efficiency being 70% (3)
8. What are the advantages of bundled conductors? (3)
9. Define the terms load factor and diversity factors. (2)
10. Explain the consequences of disconnecting a neutral in a $3\phi - 4$ wire system (2)

PART – B (50 Marks)

- 11 a) What are the various types of steam turbines and give their uses (5)
b) Give the advantages and disadvantages of hydro electric plant (5)
- 12 a) The methods for improving string efficiency of overhead line insulators (5)
b) Explain how sag is determined for an overhead line conductor taking into account, the effects of wind and ice loading (5)
- 13 a) Explain working principle of nuclear power plant with neat schematic diagram explaining each each block. (5)
- 14 $A3\phi$ 50 Hz, 66 KV overhead transmission line has its conductors arranged At the Corners of an equilateral triangle of 3m sides and diameter of each conductor is 1.5cm. Determine the inductance and capacitance per phase. If the length of line is 100Km. Calculate the charging current. (10)
- 15 a) Explain the different types of tariffs (5)
b) Explain depreciation by sinking fund method (5)

16. A two wire distributor is loaded as shown in figure below. The voltage at the two Ends is 230 V & 230V respectively. The distance between sections are give Meters. Determine the cross section of the conductor for a minimum consumer's voltage of 220V.



17. Derive expression for electric stress of a single core cable. Where is the stress Maximum? Where it is minimum and why? (10)

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FACULTY OF ENGINEERING**B.E. 2/4 (EIE.) II Semester (Suppl) Examination, December 2017****Subject: Thermodynamics & Fluid Mechanics****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part A and any five questions from Part B.****PART-A (25 Marks) Each Question 2.5 Marks**

1. Explain closed, open and isolated systems?
2. Plot a sketch of Diesel Cycle on T-S diagram
3. What is the effect of clearance volume on isothermal efficiency of a reciprocating air compressor
4. Draw velocity triangles for flow over a blade of 50% reaction steam turbine
5. Define density, specific weight, specific volume
6. Define stream tube?
7. List the flow measuring devices which employ Bernoulli's Equation.
8. What is a pitot-static tube?
9. Explain dynamic similarity?
10. What is the effect of Reynolds Number of flow through pipes.

PART- B(5 X 10 =50 MARKS)

11. Air. At 15°C and 1.05 bar occupies a volume of 0.02 m³. The air is heated at constant volume until the pressure is 4.2 bar and then cooled at constant pressure back to the original temperature. Calculate (i) the net heat flow to or from the air and (ii) the net entropy change. Sketch the process on T-S diagram. 10
12. Compare Open and Closed cycle Gas Turbines. Represent the cycles on P-V and T-S diagrams. 10
- 13 a) Derive continuity equation for fluid flow 5
b) Describe the utility of stream and velocity functions in defining fluid flows 5
- 14 A Venturimeter has its axis vertical, the inlet and throat diameters being 150 mm and 75 mm respectively. the throat is 225 mm above inlet and venturimeter constant = 0.96. Petrol of specific gravity 0.78 flows up through the meter at a rate of 0.029 m³/s. Find the pressure difference between inlet and throat. 10
- 15 For flow over flat plate, discuss the formation of laminar and turbulent boundary layers and describe their characteristics 10
- 16 a) Prove the equivalence of Kelvin Planck & Clausius Statements. 5
b) Discuss the classification of Steam Turbines. 5
17. Write short notes on
a) Darcy's friction factor 5
b) Four stroke and Two stroke engines 5

FACULTY OF ENGINEERING
B.E. 2/4 (M/P) II - Semester (Suppl.) Examination, December 2017

Subject : Thermodynamics

Time : 3 Hours

Max. Marks: 75

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

PART – A (25 Marks)

- 1 Define State and process.
- 2 State the applications of zeroth law of thermodynamics.
- 3 How is isothermal heat addition process carried out? Mention two cycles which employ such process.
- 4 Explain energy as a property of a system.
- 5 Define Clausius statement of second law of thermodynamics.
- 6 Explain the principle of increase of entropy.
- 7 Explain critical state of a substance.
- 8 Write the equations of Maxwell relation ?
- 9 With the help of T-S and P-V diagram explain Rankine cycle.
- 10 How are the characteristic gas constant and the molecular weight of a gas mixture computed?

PART-B (50 Marks)

- 11 a) A mass of 1.5 kg of air is compressed in a quasi-static process from 0.1MPa to 0.7 MPa for which $pv = \text{constant}$. The initial density of air is 1.16kg/m^3 . Find the work done by the piston to compress the air. [6]
 (b) Explain positive and negative work interactions with an example. [4]
- 12 (a) A system composed of 2 kg of the above fluid expands in a frictionless piston and cylinder machine from an initial state of 1 MPa, 100°C to a final temperature of 30°C . If there is no heat transfer, find the net work for the process. [6]
 (b) Write down the heat transfer relation for closed system undergoing polytropic process? [4]
- 13 (a) Water is heated at a constant pressure of 0.7 MPa. The boiling point is 164.97°C . The initial temperature of water is 0°C . The latent heat of evaporation is 2066.3 kJ/kg . Find the increase of entropy of water, if the final state is steam. [5]
 (b) Derive Gibbs and Helmholtz functions. [5]
- 14 (a) Draw the phase equilibrium diagram for a pure substance on T-S plot with relevant constant property lines. [5]

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- (b) Air is compressed reversibly according to the law $pv^{1.25} = \text{const.}$ from an initial pressures of 1 bar and volume of 0.9 m^3 to a final volume of 0.6 m^3 . Determine the final pressure and the change of entropy per kg of air. [5]
- 15 (a) Derive relations for molecular weight and specific heats for a mixture in terms of its component values. [5]
(b) List out air standard cycle. Explain any one in detail. [5]
- 16 Two engines are to operate on Otto and Diesel cycles with the following data: Maximum temperature 1400 K, exhaust temperature 700 K. State of air at the beginning of compression 0.1 MPa, 300 K. Estimate the compression ratios, the maximum pressures, efficiencies, and rate of work outputs (for 1 kg/min of air) of the respective cycles. [10]
- 17 (a) Under what condition the relationship $dQ = dU + dW$ is valid? [3]
(b) How are the first and second law efficiencies correlated? [4]
(c) Give 3 examples of irreversible process. [3]

FACULTY OF INFORMATICS**B.E. 2/4 (IT) II-Semester (Supplementary) Examination, December 2017****Subject: Web Technologies****Time : 3 Hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

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| 1 | Explain different table tags used in HTML. | 3 |
| 2 | Define REST service. | 2 |
| 3 | What is J Query? | 2 |
| 4 | Explain XSLT style sheets. | 3 |
| 5 | Define page directives of JSP. | 2 |
| 6 | Explain the basic servlet structure. | 2 |
| 7 | Give the differences between JSP and servlet. | 3 |
| 8 | Define WSDL. | 2 |
| 9 | State goals of UDDI. | 3 |
| 10 | Describe the web controls used in ASP.NET. | 3 |

PART – B (5 x 10 = 50 Marks)

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| 11 a) | Explain and implement the basic tags of HTML. | 5 |
| b) | Explain the CSS Box model. | 5 |
| 12 | Write the XML schema for the XML document which has the student details with the following fields (regno, studname, phone, email-ID). Also assume values of each field. | 10 |
| 13 | Write a Java servlet program to show passing of initialization parameters from web.XML. | 10 |
| 14 a) | What is MVC model? | 4 |
| b) | Write a JSP program to implement any two JSP objects. | 6 |
| 15 a) | How to access MS Access database using JSP? | 5 |
| b) | Explain in detail about the structure and content of SOAP message. | 5 |
| 16 a) | Explain with an example how UDDI and WSDL work together. | 7 |
| b) | Describe the rich controls used in ASP.NET. | 3 |
| 17 a) | Explain the working of ASP.NET and AJAX, with suitable example. | 5 |
| b) | How to manage data using ADO.NET. | 5 |
