

## FACULTY OF ENGINEERING

B.E. I – Year (Backlog) Examination, November / December 2018

Subject: Mathematics – II

Time: 3 Hours

Max.Marks: 75

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

## PART – A (25 Marks)

- 1 Solve  $\frac{dy}{dx} = e^x + y$ . 2
- 2 Find the orthogonal trajectories of the family of curves  $y^2 = 4ax$ . 3
- 3 Solve  $(D^4 - 1)y = 0$ . 2
- 4 Determine whether the functions  $e^x$ ,  $e^{-x}$ ,  $\sinh x$  are linearly dependent. 3
- 5 Define ordinary and singular points of  $a_0(x)y'' + a_1(x)y' + a_2(x)y = 0$ . 2
- 6 Prove that  $P_n(1) = 1$ . 3
- 7 State the relation between Beta and Gamma functions. 2
- 8 Prove that  $J'_0(x) = -J_1(x)$ . 3
- 9 Find  $L\{t e^t\}$ . 2
- 10 Find the inverse Laplace transform of  $\frac{s+2}{s^2-4}$ . 3

## PART – B (5x10 = 50 Marks)

- 11 a) Solve  $xy \, dx - (x^2 + y^2) \, dy = 0$ . 5
- b) If the temperature of the air is 298 K and the substance cools from 370 K to 330 K in 10 minutes, find when the temperature will be 295 K. 5
- 12 a) Solve  $x^2 y'' + xy' - y = x^3$ . 5
- b) Apply method of variation of parameters to solve  $y'' + y = \sec x$ . 5
- 13 a) Express  $x^3 + 2x^2 - 7x + 5$  in terms of Legendre polynomials  $P_n(x)$ . 5
- b) Prove that  $\int_{-1}^1 P_m(x) P_n(x) \, dx = 0$ , where  $m \neq n$ . 5
- 14 a) Prove that  $\Gamma(1/2) = \sqrt{f}$ . 5
- b) Show that  $J_3(x) = \left(\frac{8-x^2}{x^2}\right) J_1(x) - \frac{4}{x} J_0(x)$ . 5

- 15 a) Find the Laplace transform of  $f(t) = \frac{2 \sin^2 t}{t}$ . 5
- b) Using convolution theorem, find  $L^{-1} \left\{ \frac{1}{(s+1)(s+2)} \right\}$ . 5
- 16 a) Find the general solution and singular solution of  $y = x y' - (y')^3$ . 5
- b) Solve the system of equations  $\frac{dy_1}{dt} = 2y_1 + y_2$ ,  $\frac{dy_2}{dt} = y_1 + 2y_2$ . 5
- 17 Find the series solution of the differential equation  $4x^2 \frac{d^2 y}{dx^2} - 8x \frac{dy}{dx} + 5y = 0$  about  $x = 0$  by Frobenius method. 10

\*\*\*\*

**FACULTY OF ENGINEERING & TECHNOLOGY**

**B.E. / B.Tech. (Bridge Course) II- Semester (Backlog) Examination,**

**November / December 2018**

**Subject : English**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer all questions from Part A any five questions from Part B**

**PART-A (25 Marks)**

**A. Rewrite any Ten of the following sentences after making necessary corrections.**

1. The news are very interesting.
2. Each of them were given a certificate.
3. I am doing homework the whole morning.
4. Everyone are enjoying the IPL series.
5. Politics are a dirty game.
6. Drive slowly lest you may not meet an accident.
7. One of my friends has bought a farm house.
8. Neither of the girls have the opportunity to go abroad.
9. Too many things is being done by him.
10. Gopal joined in the army last year.

**B. Convert the following sentences into passive voice**

**5x1 = 5 Marks**

- i. He teaches us grammar.
- ii. We must respect elders
- iii. Open the door.
- iv. Don't subject the animals to cruelty
- v. Look! They have painted the door.

**C. Read the following sentences and fill in the gaps by using the correct form of the words from the options given below.**

**Shall, Denied, Doubt, Modest, Was**

- a. Gandhiji was a humble man known for his \_\_\_\_\_
- b. The accused \_\_\_\_\_ having made any statement.

contd...2..

-2-

- c. If I \_\_\_\_\_ you, I would have told him the truth.  
 d. The father divided prosperity among his sons lest they \_\_\_\_\_ quarrel afterwards.  
 e. Indians need sincere leaders, not people of integrity.

D. Mark the stress on the following words.

5x1 =5 Marks

- i. Electricity ii. Engineer iii. Photography iv. Congratulations v. Develop

**PART-B (50 Marks)**

Answer any Five questions, choosing one from each unit.

## Unit-I

Answer either A or B

1. A. Read the following passage and answer the questions that follow.

10 Marks

The 'No Child Left Behind Act' of 2001 has served as a catalyst in many school improvement efforts. Schools in the United States are responding to meet the challenge of these improvement efforts, although in doing so, some are caught in a decision making and funding quagmire. They ask, "How can we best support teachers so that all students can succeed?" Using technology as a means of closing achievement gaps is one option schools are considering more purposefully and effectively. This includes using assistive technologies for students with special needs and creating a systemic approach to change that benefits all students including subgroups.

Assistive technologies are technologies that support students with disabilities, of which a total of 6.5 million were being served through the Individuals with Disabilities Education Act of 1997. This Act defines an assistive technology device as "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to system, whether acquired commercially off the shelf, modified, or customized, that is used to increase maintain or improve functional capabilities of child with a disability," Regardless of their previous experience, may administrators and educators are expected to be change agents of school improvement efforts today and be well versed and knowledgeable about assistive technology despite the fact that the definition of assistive technology is so broad and the field is relatively new.

i. "Schools found themselves in a funding quagmire." here 'quagmire' means

- a. boggy area    b. isolation    c. indebtedness    d. quicksand

ii. According to this report, 'achievement gaps' can be closed by

- a. Investing on more reference books in the library  
 b. Conducting after school special classes for weak students.  
 c. Getting more financial supporting from the government.  
 d. Recruiting and training more personnel to help the special needs children.

iii. Functional capabilities constitute the

- a. Ability to go for higher studies
- b. the skills to cope with every day challenges
- c. the determination to succeed
- d. exceptional talent in academic or literary activities

iv. A 'product system' here means

- a. services or financial investment that are not commercially value adding.
- b. important resources not available to the disabled persons.
- c. special training equipment designed for disabled children.
- d. products that are freely accessible to schools only.

V. Find a word in the report that means 'Widely circulated'

- a. systemic
- b. achievement
- c. product
- d. change

**OR**

B. What is the moral of the story 'A Slip of the Tongue'.

Unit – II

Answer either A or B 10 Marks

II. A. You are a Site Engineer working for Metro Rails, Hyderabad. You are asked to submit quarterly report on the progress of work completed. Write a report.

**OR**

B. Write a report on the rising levels of pollution of water bodies in and around Hyderabad city.

Unit – III

Answer either A or B 10 Marks

III. A. Rearrange the following sentences to make a meaningful paragraph.

- a. But this does not mean that death was the Egyptians only preoccupation.
- b. Even papyri come mainly from pyramid temples.
- c. Most of our traditional sources of information about the Old Kingdom are monuments of the rich like pyramids and tombs.
- d. Houses in which ordinary Egyptians lived have not been preserved, and when most people died they were buried in simple graves.
- e. We know infinitely more about the wealthy people of Egypt than we do about the ordinary people, as most monuments were made for the rich.

**OR**

B. What are J.C. Hill's views on Good Manners.

-4-

Unit – IV

Answer either A or B 10 Marks

IV. A. Write a letter to the commissioner, GHMC on the bad condition of the roads in your area.

**OR**

B. Apply for the position of a Software engineer, along with your resume to the HR Manager of XYZ software solutions Ltd.

Unit – V

Answer either A or B 10 Marks

V. A. 'Internet is more of boon than a bane', write an essay in about 300 words.

**OR**

B. The phenomenon of 'Brain Gain ' in India.

\*\*\*\*\*