Code No. 5011 / O

FACULTY OF ENGINEERING AND INFORMATICS

B.E. I - Year (Old) Examination, January 2016

Subject : Mathematics - II

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 Form the differential equation by eliminating the arbitrary constants a, b from the equation $ax^2 + by^2 = 1$. 2

2 Solve $\frac{dy}{dx} = e^x, y(0) = 1$. 3

3 Solve $(D^4 - 81)\, y = 0$, where $D \equiv \frac{d}{dx}$. 2

4 Find the particular integral of $(D^2 - 4)y = \cos^2 x$. 3

5 Find the Laplace transform of $f(t) = \sin^2 t$. 2

6 Find the inverse Laplace transform of $F(s) = \frac{1}{s^2 - 4s + 8}$. 3

7 Classify the singular points of the differential equation $x^2 y'' - 5y' + 3x^2 y = 0$. 2

8 Express $f(x) = 2x^3 - 6x^2 + 5x - 3$ in terms of Legendre polynomials $P_n(x)$. 3

9 Evaluate $\int_0^\infty t^4 e^{-2t^2} dt$ 2

10 Evaluate $\frac{d}{dx}[\text{erf}(\sim x)]$ 3

PART – B (50 Marks)

11 a) Find the orthogonal trajectories of the family of curves $\frac{x^2}{a^2} + \frac{y^2}{a^2 + a} = 1$, a being parameter. 5

b) Find the general solution of the differential equation $y^1 = 2xy^2 + (1 - 4x)\, y + 2x - 1$ if y = 1 is a solution of the equation. 5

12 a) Find the general solution of the equation $y'' + y = \tan x$, by the method of variation of parameters. 5

b) Find the general solution of the differential equation $y'' - y' - 6y = 0$ if $y_1 = e^{2x}$ is a known solution. 5

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13 a) Find the inverse Laplace transform of the function $F(s) = \log\left(\frac{s+a}{s+b}\right)$, where a, b are constants. 5

b) Evaluate $\int_0^\infty e^{-2t}\, t \sin 3t\, dt$ 5

14 Obtain the series solution of the equation $(1-x^2)y'' - 2xy' + 6y = 0$ about x = 0. 10

15 a) Evaluate $\int_0^p x^m (1-x^2)^n dx$ in terms of beta function, where m, n, p, q are positive constants. 5

b) Find the expression for $T_3^1(x)$ in terms of $T_3(x)$ and $T_2(x)$. 5

16 a) Solve $(y^4 + 2y)\, dx + (xy^3 + 2y^4 - 4x)\, dy = 0$. 5

b) Solve $(D^2 - 2D + 1)\, y = xe^x \cos x$. 5

17 a) Find the Laplace transform of the function. 5

F(t) = cos t u(t – π) where u(t – π) Is the unit step function.

b) Show that $P_n(-x) = (-1)^n P_n(x)$ where $P_n(x)$ is the Legendre polynomial of degree n. 5

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Code No. 5003 / N

FACULTY OF ENGINEERING & INFORMATICS

B.E. I-Year (Supplementary) Examination, January 2016

Subject : Mathematics – II

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 Solve $y \sin 2x\, dx - (1+y^2+\cos^2 x)\, dy = 0$. 3

2 Solve $\frac{dy}{dx} - y \tan x + 2 \sin x = 0$. 2

3 Find a particular integral of $(D^4+4)y = e^x$. 3

4 Solve $\frac{d^4y}{dx^4} - m^4 y = 0$. 2

5 Determine the nature of the point x = 0 for the differential equation $x^4 y^{11} + \sin x . y = 0$. 3

6 Express $f(x) = 3x^2 + 2x - 6$ in terms of Legendre polynomials. 2

7 Evaluate $\frac{d}{dx}[\text{erfc}(\alpha x)]$. 3

8 Evaluate $\int_0^\infty e^{-x^2}\, dx$. 2

9 Evaluate $L\{e^{-3t} \sin 4t\}$. 3

10 Evaluate $L^{-1}\left\{\frac{2}{s^2+4}\right\}$. 2

PART – B (50 Marks)

11 a) Solve $(x\, y^3 + y)dx + 2(x^2 y^2 + x + y^4)dy = 0$. 5

b) Find the orthogonal trajectories of the family of confocal conics $\frac{x^2}{a^2} + \frac{y^2}{a^2+\lambda} = 1$, where λ is the parameter. 5

..2

12 a) Solve $(D^2 + 2D + 1)y = \cos x$. 5

b) Solve $x^2D^2y - 3xDy + 5y = x^2 \sin \log x$ 5

13 Find the series solution of the differential equation 10
$y^{11} + x^2y = 0$ about x = 0 .

14 a) Evaluate $\int_0^{\frac{\pi}{2}} \sqrt{\tan \theta}\, d\theta$. 5

b) Show that $J_3^1(x) = \left(\frac{12}{x^2} - 1\right) J_0(x) + \left(\frac{-24}{x^3} + \frac{5}{x}\right) J_1(x)$. 5

15 a) Evaluate $L\left\{ t \int_0^t e^{-5u}\, du \right\}$. 5

b) Using convolution, solve the initial value problem. 5

$y^{11} + 9y = \sin 3t, \quad y(0) = 0 = y^1(0)$.

16 a) Solve the differential equation. 5

$y = px + (1+p^2)^{1/2}$, where $p = \frac{dy}{dx}$.

b) Solve $y^{11} + 4y = 4 \tan 2x$ by the method of variation of parameters. 5

17 a) Show that $\int_{-1}^{1} P_m(x) P_n(x)\, dx = 0, m \neq n$.. 5

b) Prove that $\beta(m, n) = \frac{\Gamma m\, \Gamma n}{\Gamma(m+n)}$. 5

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Code No. 5395 / S

FACULTIES OF ENGINEERING & TECHNOLOGY

B.E. / B.Tech. (Bridge Course) II – Semester (Suppl.) Examination, January 2016

Subject : ENGLISH

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

Note: Answer all questions from Part-A. Answer ONE question from each unit of Part-B.

PART – A (25 Marks)

A Rewrite any TEN of the following sentences after making necessary corrections. **10 x 1 = 10**

1 His brother was junior than me.
2 The class was between 10 am to 11 am.
3 Where are your luggages?
4 None of them were present in the party.
5 I think her sister is more cleverer in than she.
6 Please meet my cousin sister.
7 He was walking very fastly on the road.
8 Every week she will visit her grandparents.
9 I don't like this trousers.
10 I want little more salt.
11 Can you tell me where is the post office.
12 She loves listening music.

B Fill in the blanks with appropriate prepositions : **5 x 1 = 5**

1 I will meet you _____ 9 o'clock.
2 She jumped _____ the well.
3 She prefers dance _____ music.
4 The UNO came into existence_____ 1945.
5 You have to choose one _____ these.

C Give antonyms for the following : **5 x 1 = 5**

1 pleasure 2 courage 3 trivial 4 novel 5 wealthy

D Choose the word with correct spelling from the given options : **5 x 1 = 5**

1	a) accompany	b) accompany	c) acompani	d) accompany
2	a) judgement	b) jugment	c) judgment	d) jajment
3	a) acsent	b) accent	c) acent	d) accent
4	a) separate	b) separate	c) saperate	d) separate
5	a) occasion	b) occasion	c) occasion	d) occasion

PART – B (50 Marks)

Unit – I

Answer either A or B.

I A Read the following passage and answer the questions that follow: **10**

Even a leisurely game like cricket, demanding grace rather than strength, can cause much ill-will, as we saw in the controversy over body-line bowling and over the rough tactics of the Australian team that visited England in 1921. Football, a game in which everyone gets hurt and every nation has it own style of play which seems unfair to foreigners, is far worse. Worst of all is boxing. One of the most horrible sights in the world is a fight between white and coloured boxers before a mixed audience. But a boxing audience is always disgusting, and the behaviour of the women, in particular, is such that the army, I believe, does not allow them to attend its contests. At any rate, two or three years ago, when Home guards and regular troops were holding a boxing tournament, I was place on guard at the door of the hall, with orders to keep the women out.

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Questions

1 Which game demands grace?
2 In which game does everyone get hurt?
3 According to the above which is the worst game?
4 What is considered the most horrible sight?
5 Who is prevented from attending boxing contests?

OR

B Summarise Hill's views on good manners.

Unit – II

Answer either A or B.

II A Imagine you are an engineer working for the Hyderabad Metro rail. You are asked to submit a quarterly report on the progress of work completed. Write a report). (You may imagine the needed details). 10

OR

B Imagine you are the general secretary of the student's union of your college. Prepare the annual report describing the various student activities in your college to be presented on the Annual Day function.

Unit – III

Answer either A or B.

III A Summarise and give a title to the following :

It is physically impossible for a well-educated or brave man to make money the chief object of his thoughts, just as it is for him to make his dinner the principal object of them. All healthy people like their dinners, but their dinner is not the main object of their lives. So all healthy minded people like making money – ought to like it and enjoy the sensation of winning it; it is something better than money. A good soldier, for instance, mainly wishes to do his fighting well. He is glad of his pay-very properly so, and justly grumbles when you keep him ten years without it–still his main notion of life is to win battles, not to paid for winning them. So of clergyman's object is essentially to baptize and preach, not to be paid for preaching. So of doctors. They like fees no doubt, -- out to like them; yet if they are brave and well educated, the entire object of their lives is a not fee. They, on the whole, desire to cure the sick, and, if they are good doctors, and the choice were fairly put to them, would rather cure their patient and lose their fee than kill him and get it. And so with all the other brave the rightly trained men; their work is first, their fee second very important always, but sill second (233 words). 10

OR

B What are Lawrence's views on education as expressed in his poem 'The Best of School'?

Unit – IV

Answer either A or B.

IV A Write a letter to Municipal Commissioner expressing concern over the accumulating garbage in cities. 10

OR

B Write a letter to a Software company enquiring about good language software for the language lab.

Unit – V

Answer either A or B.

V A Write an essay on the necessity of improving communication skills for good employment. 10

OR

B Write an essay on the role of engineers in developing environment friendly materials.

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