

FACULTY OF ENGINEERING

B.E. I – Year (Backlog) Examination, December 2017

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 $y(1+xy) dx + x(1-xy) dy = 0$. 3
- 2 Find the orthogonal trajectories of the family of curves $x^{2/3} + y^{2/3} = a^{2/3}$ where 'a' is a parameter. 2
- 3 Solve $(D^3 - 3D + 2)y = 0$ where $D \equiv \frac{d}{dx}$. 3
- 4 Find a particular integral of $(D^3 + 16D)y = \sin 4x$. 2
- 5 Locate and classify the singular points of the differential equation $(1-x^2)y'' + 2xy' + y = 0$. 3
- 6 Evaluate $P_n'(-1)$. 2
- 7 Evaluate $\int_0^{\infty} x^4 e^{-x^4} dx$ in terms of Gamma function. 3
- 8 Evaluate $\int_0^1 x^p (1-x^q)^r dx$ in terms of Beta function, where p, q, r are positive integers. 2
- 9 Evaluate $L\{e^{-t}(t+2)\}$. 3
- 10 Evaluate $L^{-1}\left\{\left(\frac{\sqrt{s}-1}{s}\right)^2\right\}$. 2

PART – B (5x10 = 50 Marks)

- 11 a) Solve $y(2xy+e^x) dx - e^x dy = 0$. 5
 b) Find the general solution of the differential equation
 $y' = 2xy^2 + (1-4x)y + 2x - 1$ if $y = 1$ is a solution of the equation. 5
- 12 a) Solve $(x^2D^2 - xD - 3)y = x^2 \log x$. 5
 b) Solve $(D^2 + 2D + 1)y = x e^{-x}$. 5
- 13 Solve $2x^2 y'' - xy' + (1-x^2)y = 0$ by using Frobenius method. 10

- 14 a) Express $J_3(x)$ in terms of $J_0(x)$ and $J_1(x)$. 5
- b) Show that $\operatorname{erf}(-x) + \operatorname{erf}(x) = 0$. 5
- 15 a) Evaluate $L \left\{ \int_0^t \frac{\sin 3u}{u} du \right\}$. 5
- b) Evaluate $L^{-1} \left\{ \log \left(\frac{s^2 + b^2}{s^2 + a^2} \right) \right\}$. 5
- 16 a) Find the general and singular solutions of the differential equation $y = xp - p^3$ where $p = \frac{dy}{dx}$. 5
- b) Solve $(D^2+1)y = x \cos x$ by the method of variation of parameters. 5
- 17 a) Show that $\int_{-1}^1 P_m(x) \cdot P_n(x) dx = 0$ if $m \neq n$. 5
- b) Solve the differential equation $y'' + y = 2e^t$, $y(0) = 0$, $y'(0) = 2$ by using Laplace transform.

FACULTY OF ENGINEERING

B.E. / B.Tech. (Bridge Course) II – Semester (Backlog) Examination, December 2017

Subject: English

Time: 3 Hours

Max. Marks: 75

Answer all questions of Part A.
Answer one question from each unit of Part B.

PART A - (Marks: 25)

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

10×1=10

1. There was very few traffic on the road.
2. Neither letter were properly addressed.
3. Can you tell me where can I buy some postcards?
4. I closed the door as quiet as I could.
5. I hope they don't rise prices again.
6. I didn't want to risk to lose all my money.
7. His father resembled to a man that i used to work for.
8. On Saturday morning, I usually go for shopping.
9. It was very kind for you to invite me.
10. I am doing an evening course on computer programming.
11. The book consists eight chapters and an introduction.
12. The paint should be applied on clean surfaces only.

B. Convert the following sentences into passive voice.

5×1=5

- i) We must not allow water to come into contact with sodium.
- ii) We ought to place the metal on a dry surface.
- iii) Friction reduces the efficiency of machines.
- iv) They should have submitted the project report.
- v) You must complete the assignment by the end of this week.

C. Read the following paragraph and fill in the gaps by using the correct form of verbs from the options given below:

5×1=5

transmit	produce	result	call	transfer
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All sources of sound _____ vibratory energy at the frequencies within the audible range of the ear. Some of the most common sound sources are vibrating strings, vibrating air columns, vibrating membranes, and vibrating rods. This vibration energy _____ to the surrounding medium, normally air, where it _____ from particle to

particle to the ear. Many sound sources have different natural frequencies or resonant frequencies of vibration. Each different vibratory state _____ a mode of vibration. At these resonant frequencies, a small energy input _____ in a large amplitude.

D. Mark stress on the following words.

5×1=5

- i. Institution
- ii. Opportunity
- iii. Musical
- iv. Content (n)
- v. Trustee

PART B (Marks: 50)

Answer any **Five** questions, choosing **one** from each unit.

UNIT I

Answer either A or B.

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

The Man Booker Prize for Fiction is awarded every year for a novel written by a writer from the Commonwealth or the Republic of Ireland and it aims to represent the very best in contemporary fiction. The prize was originally called the Booker-McConnell Prize, which was the name of the company that sponsored it, though it was better-known as simply the 'Booker Prize'. In 2002, the Man Group became the sponsor and they chose the new name, keeping 'Booker'. Publishers can submit books for consideration for the prize, but the judges can also ask for books to be submitted they think should be included. Firstly, the Advisory Committee gives advice if there have been any changes to the rules for the prize and selects the people who will judge the books. The judging panel changes every year and usually a person is only a judge once.

Great efforts are made to ensure that the judging panel is balanced in terms of gender and professions within the industry, so that a writer, a critic, an editor and an academic are chosen along with a well-known person from wider society. However, when the panel of judges has been finalized, they are left to make their own decisions without any further involvement or interference from the prize sponsor. The Man Booker judges include critics, writers and academics to maintain the consistent quality of the prize and its influence is such that the winner will almost certainly see the sales increase considerably, in addition to the £50,000 that comes with the prize.

1. What is the aim of the Man Booker Prize?
2. What is the procedure of application for Man Booker Prize?
3. What is the role of Advisory Committee?
4. What is the composition of the judging panel?

5. What kind of benefit will the prize winner get?

OR

B. What does J.E.B.Gray convey through 'A slip of the Tongue'?

UNIT II

Answer either A or B.

10 marks

II. A. Imagine that you and your classmates went on a study tour for one week. As a part of the tour you attended one conference, visited several research labs and attended some workshops. Write a short report to the Principal of your college covering all the details of your tour.

OR

B. The Chairman, Energy Development and Conservation Council, New Delhi, has been concerned about the recurring mismatch between the demand and supply of electricity all over the country. As the Secretary of the Council, you have been asked to study the consumption pattern in agriculture, commercial and domestic sectors and write a report to be submitted to the Chairman.

UNIT – III

Answer either A or B.

III. A. Write a précis and give an apt title to it.

10 marks

People often ask which is the most difficult language to learn, and it is not easy to answer because there are many factors to take into consideration. Firstly, in a first language the differences are unimportant as people learn their mother tongue naturally, so the question of how hard a language is to learn is only relevant when learning a second language. Some people seem to learn languages readily, while others find it very difficult. Teachers and the circumstances in which the language is learned also play an important role, as well as each learner's motivation for learning. If people learn a language because they need to use it professionally, they often learn it faster than people studying a language that has no direct use in their day to day life. No language is easy to learn well, though languages that are related to our first language are easier. Learning a completely different writing system is a huge challenge, but that does not necessarily make a language more difficult than another. In the end, it is impossible to say that there is one language that is the most difficult language in the world.

OR

B. What is 'The Best of School' according to D.H. Lawrence.

UNIT – IV

Answer either A or B.

IV. A. Write a letter of complaint to Manager, Eureka Forbes about the non-installation of water purifier even after a week of its delivery.

OR

B. Write a letter to the editor of the Hindu about the unhygienic maintenance of a hotel in your locality.

UNIT -V

Answer either A or B.

V. A. Write an essay on 'Make in India'.

OR

B. Write an essay on the merits and demerits of online shopping.