FACULTY OF ENGINEERING

B.E. II – Semester (CBCS) (Backlog) Examination, December 2019

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 (10x2 = 20 Marks)

1) Solve $\dfrac{dy}{dx} + 2xy = 2xy^2$. [2]

2) Find the general and singular solutions of $y = px + \dfrac{a}{p}$. [2]

3) Solve $\left(D^2 + 4\right)y = e^{2x}$. [2]

4) Find the particular integral of $\left(D^2 - 6D + 9\right)y = x^2 + 2x$. [2]

5) Solve the differential equation : $y'' + y = 0$ using series method. [2]

6) Show that $P_n(-x) = (-1)^n P_n(x)$. [2]

7) Evaluate $\displaystyle\int_0^\infty x^4 e^{-2x^2}\, dx$. [2]

8) Evaluate $J_1'(x)$ in terms of $J_0(x)$ and $J_1(x)$. [2]

9) Evaluate $L\{\cos^2 at\}$. [2]

10) Evaluate $L^{-1}\left\{\dfrac{s+4}{(s-2)(s+3)}\right\}$. [2]

PART – B (5 x 10 = 50 Marks)

11. a) Solve $y\left(x^2 y^2 + 2\right)dx + x\left(2 - 2x^2 y^2\right)dy = 0$.   5

   b) Find the general solution of the Riccati's equation $y' = 3y^2 - (1 + 6x)y + 3x^2 + x + 1$, if $y = x$ is a particular solution.   5

12. a) Solve $x^2 y'' + 5xy' + 4y = x\log x$ 5

   b) Solve $y'' + y = \tan x$ by the method of variation of parameters.   5

13. Using Frobenius method, find the series solution of $xy'' + (1-x)y' + 3y = 0$.   10

14. a) Show that $J_n''(x) = \dfrac{1}{4}\left(J_{n-2}(x) - 2J_n(x) + J_{n+2}(x)\right)$.   5

   b) Show that $\displaystyle\int_0^\infty e^{-t^2 - 2rt}\, dt = \dfrac{\sqrt{f}}{2} e^{r^2}\left[1 - erf(r)\right]$.   5

15. a) Evaluate $L^{-1}\left\{\dfrac{1}{S(S+2)^2}\right\}$.   5

  b) Using Laplace transform, solve the initial value problem $y''+2y'+5y=1+t$, $y(0)=4,\ y'(0)=-3.$ 5

16. a) Find the orthogonal trajectories of the family of curves $\dfrac{x^2}{a^2}+\dfrac{y^2}{a^2+\lambda}=1, where\}$ is a parameter.   5

  b) Using the method of reduction of order,
    solve $\left(x^2-1\right)y''-2xy'+2y=0,\ \ if\ \ y=x$ is a solution $\left(Here\ x\neq\pm 1\right).$ 5

17. a) Show that $P_n(x)=\dfrac{1}{2^n\,n!}\dfrac{d^n}{dx^n}\left(x^2-1\right)^n.$ 5

  b) Evaluate $L\left\{\dfrac{e^{-3t}\sin(4t)}{t}\right\}.$ 5

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FACULTY OF ENGINEERING
BE II - Semester (AICTE) Examination, December 2019

Subject: English

Time:3hours   **Max marks:70**

Note:Answer all questions from Part-A & any Five questions from Part-B
PART – A (20 Marks)

1. **Fill in the blanks with:**   **4x1/2=2**
     a. _____summer of 1996 was hot and dry. (Articles)
     b. My friend is good ___playing volleyball (preposition)
     c. They were bored because there was _____to do.(determiners)
     d. Henry had_____ idea what the answer to the question was. (determiners)

2. Fill in the blanks with appropriate affixes: **4x1/2=2**
     a hesitate+------
     b. similar+-------
     c. -------+write
     d.------+ literate

3. **a Give the constituent words of the compound words:**   **4x1/2=2**
        i. Motel
        ii. Brunch
    b. **Give the blends of the following words**:
        i. friend+ enemy
        ii. international+ networks

4. a. Choose the appropriate transitions to complete the sentences: **4x1/2=2**
        i) The student's essay was badly written. _____, it was too short.
        A) in addition   B) in fact   C) moreover   D) although
        ii) You'd better wear a helmet when you go riding. _____, you could hurt yourself.
        A) therefore   B) otherwise   C) unless   D) however
   b. Fill in the blanks with appropriate Connectives given below:
    A) but   B) although   C) However   D) Because   E) Due to
    i They managed to make a meal _____ there wasn't much food in the fridge.
    ii. Lisa went shopping _____ she didn't buy anything.

5. a. Choose the correct synonym for the underlined word: **4x1/2=2**
        i. Ashoka was a <u>magnanimous</u> king.
        A) small   B) petty   C) kind   D) majestic
   b. Choose the correct antonym for the underlined word:
        ii. Real happiness does not lie in <u>material</u> possessions alone.
        A) physical   B) essential   C) spiritual   D) manual
   c. Give a one-word substitute:
        i. A person who thinks only of himself**.**
        ii. A speech made without any previous thought or preparation.

6. Transform the following sentences: **2x1=2**
     a. Distance is measured in kilometers (convert into passive)
     b. My dog was walked home by her. (convert into Active)

7. **Transform the following sentences:**   **2x1=2**
   a. "I had trekked the Himalayas this time last year". (change into Indirect speech)
   b. She said that she had been walking near the beach. (change into Direct speech)

8. **Which word best completes the sentence**   **2x1=2**
   a. The wagon can hardly _____ the weight of the load.
     A) bear   B) bare
   b. Which is the correct word? The bike's _____ failed
     A) break   B) brake

9. **Fill in the blanks with the correct form of the verbs given in the brackets:**   **2x1=2**
   i. The criminal_____(attack) the victim with a blunt object.
   ii. My mother _____ (teach) in a college.

10. **Match the following words in Column A with related words in Column B:**   **2x1=2**

	A		**B**
1	homeless	a	old
2	actor, actress	b	Died
3	getting on	c	Steward
4	Waiter / Waitress	d	Passed away
		e	On the streets
		f	actor

PART – B (50 Marks)

11. (a) "The foreigner faithfully looked in the direction indicated by Muni's fingers,   **5**
    gazed for a while at the two goats and the rocks, and with a puzzled
    expression took out his silver cigarette case and lit a cigarette. Suddenly
    remembering the courtesies of the season, he asked, "Do you smoke?" Muni
    answered, "Yes, no." Whereupon the red-faced man took a cigarette and
    gave it to Muni, who received it...".
    How did Muni react when the stranger offered a cigarette to him?

    (b) Expand the outline and write a paragraph in about 150 words :   **5**
    *pros and cons of social networking websites-large network of support-
    great medium for introverts-create stronger presence in the working world-
    cyberbullying- suppress real life interaction-sharing personal information
    and photographs-popular with youth because of considered positives.*

12. (a) Explain briefly in about 150 words the values represented in the poem "If"
    by Rudyard Kipling?   **5**
    (b) Write a paragraph in about 150 words on 'Climate change and Pollution'.   **5**
    replacement.

13. (a) "I Have a Dream" has inspired scores of people. What do *you* think makes the speech so inspirational? **5**

   (b) Write a letter to M/s. Oxford Publishing House, New Delhi complaining that the books sent by them were not those you had ordered for. Ask for You are Varun Kumar, street no-20, Alwal, Secunderabad. **5**

14 (a) Your college recently organised a Science symposium on the topic: 'Effect of pollution on quality of life'. Write a report.

   (b) What does the phrase "ages and ages" mean in the poem "The Road Not Taken" by Robert Frost? **5**

15. (a) Read the following passage and express your views on the spirit behind the sport in about 150 words: **5**
    "Even a leisurely game like cricket, demanding grace rather than strength can cause 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."

   (b) Write a Statement of Purpose in about 150 words to the admissions committee of a reputed University, seeking admission into a post graduate course. **5**

16. (a) **Answer in about 150 words each:** **5**
    i. Why did the poet get more fascinated with the second road than the first one in "The Road Not Taken"?

OR

    ii."I have a dream that one day even the state of Mississippi, a state swelling with the heat of justice, sweltering with the heat of oppression, will be transformed into an oasis of freedom and justice." What does Martin Luther King express in these lines?

   (b) **Answer in about 150 words each:** **5**
    i.Orwell says "Serious sport has nothing to do with fair play. It is bound up with hatred, jealousy, boastfulness, disregard of all rules and sadistic pleasure in witnessing violence: in other words it is war minus the shooting." Elaborate.

OR

  ii. "If you can dream– and not make dreams your master;
If you can think –and not make thoughts your aim;"
What would happen if one made thoughts the sole aim of one's life?

17. (a) Arrange the following jumbled sentences to make a meaningful paragraph. **5**
    Identify the correct order from the options given below:
    A. Science has turned the world into one unit.
    B. Practically every part of the world has friendly or hostile relationship with every other part.
    C. Nowadays such pleasing illusions are difficult to have.
    D. Since that time they have been coming closer to each other.
    E. Before the 16c, America and the far East were almost unrelated to Europe, Augusta in Rome and Han in China simultaneously imagined themselves masters of the world.
      i. ACBDE   ii. BEACD   iii. DEACB   iv. ADECB

(b) Read the passage and answer the questions that follow: **5**

To write well you have to be able to write clearly and logically, and you cannot do this unless you can think clearly and logically.If you cannot do it yet you train yourself to do it by taking particular problems and following them through, point by point to a solution, without leaving anything out and without avoiding any difficulties that you meet.

At first you find clear, step-by-step though very difficult. You may find that your mind is not able to concentrate. Several unconnected ideas may occur together. But practice will improve your ability to concentrate on a single idea and think about it clearly and logically. In order to increase your vocabulary and to improve your style, you should read widely and use a good dictionary to help you find the exact meanings and correct usage of words.

Always remember that regular and frequent practice is necessary if you want to learn to write well. It is no good waiting until you have an inspiration before you write. Even with the most famous writers, inspiration is rare. Someone said that writing is ninety-nine per cent hard work and one per cent inspiration. So the sooner you get into the habit of disciplining yourself to write, the better is the writing style.

(i) To write well the person must train himself in
    a. dealing with a difficult problem
    b. not leaving anything out
    c. thinking clearly and logically
    d. following a step-bystep approach

(ii) Initially it is difficult to write because
    a. a good dictionary is not used
    b. ideas occur without any sequence
    c. aids to correct writing are not known
    d. exact usages of words are not known

(iii) According to the passage, writing style can be improved by
    a. thinking logically
    b. writing clearly
    c. undergoing training
    d. reading widely

(iv) Famous writers have achieved success
    a.using their linguistic resources properly
    b. disciplining their skill
    c. following only one idea
    d. waiting for inspiration

(v) All the following words mean 'exact' except
    a. precise
    b. accurate
    c. very
    d. erect

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