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ARKA JAIN University, Jharkhand

1st Semester Final Examination - 2018-19

Subject: Communicative English

Course: B.tech

Time: 3 Hours

Full Marks: 70

Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A** is compulsory.
- **Part- B** contains **SIX** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.

PART - A

Q.1) Answer in brief

(4x5=20)

- a) What do you understand by the term Elementary theories of phonetics.
- b) What is the role of communication in an Organization
- c) What is barrier in communication
- d) What are the kinds of report
- e) Write about interaction strategies

PART- B

Q.2) Answer any four:

(4x5=20)

- i) What do you understand by the term "Group discussion Strategies " .?
- ii) Write about the Mechanics of Summarizing ..
- iii) Write about the Mechanics of note making.
- iv) What is "Note Writing Technique " ?
- v) What are the important features of Report ?
- vi) Write short notes on barriers of Communication " ?

PART- C

Answer any three:

(3x10=30)

Q.3) Write an essay of about 150-200 words on " Demonetization"

Q.4) Write an essay of about 150-200 words on "Saving a girl child".

Q.5) Write a letter to your Principal requesting her to shift your classes from 4th floor to any of your classes downstairs .

Q.6) Write a letter to your mother apologizing on your misconduct with her .

Compulsory for all

Q7) Imagine you are facing an interview write a small Introduction about yourself .



Subject : Engg mathematics

Course: B tech

Time : 3 Hours

Full Marks : 70

Pass Marks: 28

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- **Part-A** is compulsory.
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- **Part-D** is compulsory

PART A

Q1.) All questions are compulsory:-

A) Objective Answer Type

(5x1=5)

i) if $y = \sin ax$ then $y_n = ?$

a) $a^n \sin(ax + n\frac{\pi}{2})$

b) $a^n \cos(ax + n\frac{\pi}{2})$

c) $\sin(ax + n\frac{\pi}{2})$

d) none of these

ii) Rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$ is

a) 2

b) 3

c) 1

d) None of these

iii) Slope of the normal to the curve will be

a) $\frac{dx}{dy}$

b) $\frac{dy}{dx}$

c) $\frac{dy}{dx}$

d) $-\frac{dx}{dy}$

iv) length of the subnormal be

a) $\frac{y}{\frac{dy}{dx}}$

b) $y\frac{dy}{dx}$

c) $\frac{dy}{dx}$

d) None of these

v) $\int_0^{\frac{\pi}{4}} \log(1 + \tan\theta) d\theta = ?$

- a) $\frac{\pi}{8} \log 2$
- b) $\frac{\pi}{2} \log 2$
- c) $\frac{\pi}{4}$
- d) None of these

B] Short Answer Type

(5x2=10)

- i) Find the nth derivative of $e^{at} \sin(bt + c)$
- ii) Expand $\cos x$ by using Maclaurin's theorem
- iii) Find $\frac{\partial y}{\partial x}$ if $u = e^{xyz}$
- iv) Find symmetric matrix by using the matrix $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$
- v) Evaluate $\int_0^{\frac{\pi}{4}} \tan^6 x dx$

PART B

Q2.) Answer any four:

(4x5=20)

- i) if $y = \sin(m \sin^{-1} x)$, prove that $(1-x^2)y_{n+2} - 2(n+1)xy_{n+1} + (m^2 - n^2)y = 0$.
- ii) prove that $\frac{x+y}{a+b} = 1$ touches the curve $y = be^{-\frac{x}{a}}$ at the point where the curve crosses the axis of y
- iii) if $u = \sin^{-1} \frac{x+y}{\sqrt{x} + \sqrt{y}}$, prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \frac{1}{2} \tan u$
- iv) Find the pedal equation of cardioid $r = a(1 - \cos\theta)$
- v) Find the characteristic roots of the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & 1 \end{bmatrix}$
- vi) Evaluate $\int \sqrt{e^x - 1} dx$

PART C

Answer any Three:

(3x10=30)

Q3.) find the asymptotes of $x^3 + x^2y - xy^2 - y^3 + 2xy + 2y^2 - 3x + y = 0$

Q4.) Integrate $\int \frac{dx}{\sin x + \sin 2x}$

Q5.) Evaluate $\int_0^{\frac{\pi}{4}} \tan^n \theta d\theta$

Q6.) Investigate for what values for λ and μ the simultaneous equations

$$x + y + z = 6$$

$$X+2y+3z=10$$

$X+2y+\lambda z = \mu$ have (i) no solution (ii) a unique solution (iii) an infinite no of solutions.

Q7.) Trace the curve $y^2=x(x-1)^2$ and find the area of its loop?

Q8.) The loop of the curve $2ay^2=x(x-a)^2$ revolves about the x-axis. Find the volume of the solid so generated?

PART D

Q9.) In the curve $\frac{2a}{r} = 1 - \cos\theta$ prove that $p^2 = ar$ (5x1=5)



Subject: Environment & Ecology

Time: 3 Hours

Course: B. Tech

Full Marks: 70

Pass Marks: 28

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PART A

Q.1) All questions are compulsory

A] Multiple Choice Questions:

(10x1=10)

- a) Moisture in the air is known as–
 - i) Fog
 - ii) Snow
 - iii) Water vapor
 - iv) Humidity

- b) The term “ecology” was first proposed and introduced in 1870 by German biologist
 - i) Ernst Haeckel
 - ii) E. P. Odum
 - iii) A. G. Tansley
 - iv) Ramdeo Mishra

- c) Pedology is the study of
 - i) Soil
 - ii) Water
 - iii) Air
 - iv) None of these

- d) The unit of ozone concentration in stratosphere is
 - i) Dobson
 - ii) Decibel
 - iii) Molar
 - iv) None of the above

- e) Any Energy flow in an ecosystem is
 - i) Unidirectional
 - ii) Bidirectional
 - iii) Multidirectional
 - iv) None of the above

- f) Chemicals are responsible for the depletion of the stratospheric ozone layer??
 - i) Refrigerants
 - ii) Propellants
 - iii) Foam-blowing agents
 - iv) All of the mentioned

- g) Botanical Survey of India is at
i) New Delhi
ii) Kolkata
iii) Mumbai
iv) Chennai
- h) Enrichment of water body by nutrients like phosphorus and nitrogen is called
i) Succession
ii) Eutrophication
iii) Stratification
iv) Climax Vegetation
- i) The main energy source for the environment is
i) Solar energy
ii) Chemical energy
iii) Electrical energy
iv) None of these
- j) Which of the following radiations of the sun do greenhouse gases trap?
i) UV radiation
ii) Visible radiation
iii) Infrared radiations
iv) All the radiations

B] Very Short question(5x2=10)

- a) Wet cyclonic scrubber
b) Acid rain
c) Food chain
d) Air pollutants
e) Green hose effect

PART B

Q2. Answer any four:

(4x5=20)

- i) Distinguish primary pollutants from secondary pollutants with examples.
ii) What is bioremediation? Write the factors affecting bioremediation.
iii) Explain in detail water cycle with neat sketch.
iv) What is Biosphere? Write its components.
v) What is deforestation? Explain the effects of deforestation.
vi) What is acid rain? Write the effects of acid rain.

PART C

Answer any three:

(3x10=30)

Q.3) Acid rain is one of the most serious environmental problems emerged due to air pollution. Explain the mechanism of acid rain formation and the effects associated with that.

- Q.4) Explain food chain, food web and ecological pyramids with suitable examples and diagrams.
- Q.5) Discuss the multidisciplinary nature of Environmental Studies. Give a suitable example of how an environmental problem may be addressed with multidisciplinary approach.
- Q.6) What is air pollution and their effects? Describe two devices used to control air pollution.
- Q.7) What is meant by ozone depletion? How CFCs and other ozone depleting substance affect ozone layer.
- Q.8) What is water pollution? What steps are essentially required to control water pollution?



ARKA JAIN University, Jharkhand

1st Semester Final Examination – 2018-19

Subject : Basic Electrical Engineering

Course: B.Tech

Full Marks : 70

Pass Marks: 28

Time : 3 Hours

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PART A

Q.1) All questions are compulsory

A] Multiple Choice Questions :

(10x1=10)

i) Among the following, which is the right formula for inductance?

- (a) $L=N\Phi/t$
- (b) $L=N\Phi t$
- (c) $L=N/\Phi t$
- (d) $L=N\Phi 2t$

ii) The unit for inductance is _____

- (a) Ohm
- (b) Henry
- (c) A/m
- (d) A/s

iii) Number of parallel path in wave winding is:

- (a) 2
- (b) 3
- (c) 4
- (d) 6

iv) The power factor of pure resistive circuit is

- (a) Zero
- (b) Leading
- (c) Lagging
- (d) Unity

v) . Energy stored in inductor is:

- (a) $W = (1/4)LI^2$
- (b) $W = (1/2)LI^2$
- (c) $W = (1/2)L2I$
- (d) $W = (1/2)L2I^2$

vi). Unit of reluctance:

- (a) Ampere Turns/Weber
- (b) Weber Turns
- (c) Henry
- (d) Weber Turns/Ampere

vii) An electric current is the

- (a) flow of electrons.
- (b) opposition to electrons.
- (c) storage of charge.
- (d) ionization of atom

viii) Electric pressure is also called

- (a) resistance.
- (b) power.
- (c) voltage.
- (d) energy.

ix) . Which of the following is best conductor of electricity?

- (a) aluminum.
- (b) silver.
- (c) copper.
- (d) gold.

x) What does a capacitor store?

- (a) Current.
- (b) Charge.
- (c) Voltage.
- (d) Power.

(5x2=10)

B] Very Short question

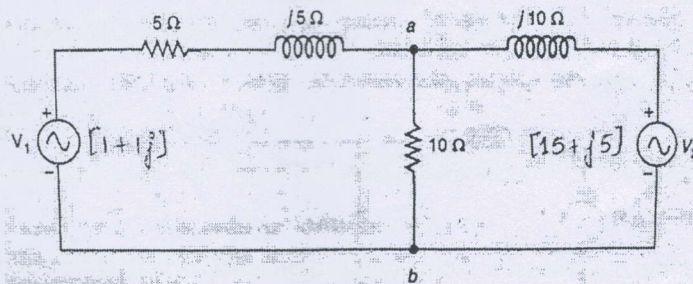
- a) State Ohm's law and mention its limitations
- b) State Kirchoff's current and voltage laws
- c) Define magnetomotive force (mmf) and reluctance.
- d) What is the function of economizer in a steam power plant ?
- e) Explain:
 - i. Instantaneous value
 - ii. Time period

PART B

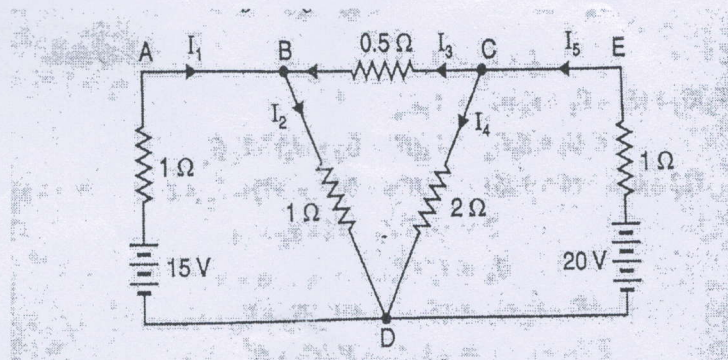
Q.2). Answer any four:

(4x5=20)

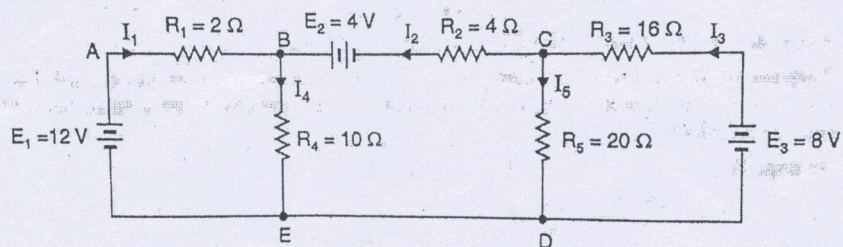
- i. An iron ring of cross-sectional area of 6 cm^2 is wound with a wire of 100 turns and has a saw cut of 2 mm. Calculate the magnetizing current required to produce a flux of 0.1 mWb if mean length of magnetic path is 30 cm and relative permeability of iron is 470.
- ii. A 4-pole lap-wound 750 rpm shunt generator has an armature resistance of 0.4Ω and field resistance of 200Ω . The armature has 720 conductors and the flux per pole is $3 \times 10^{-2} \text{ Wb}$. If the load resistance is 10Ω , determine the terminal voltage.
- iii. In the network shown in figure, the two sources acting separately produce equal currents in the branch ab. Find the ratio V_1/V_2 .



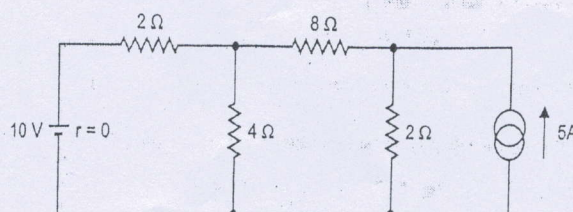
- iv. Find the total power consumed in the circuit shown in figure:



- v. Using nodal analysis, find node-pair voltages V_B and V_C and branch currents in the circuit shown in figure. Use conductance method.



- vi. Using superposition theorem, find voltage across 4Ω resistance in figure



PART C

Answer any three:

(3x10=30)

- Q.3) With a neat schematic, explain how nuclear power is generated.
- Q.4) Explain with neat sketch, the construction and principle of operation of dynamo type wattmeter
- Q.5) What is back emf in a DC motor ? Derive an expression for the armature torque developed in a DC motor
- Q.6) With neat sketch, explain the construction of core type and shell type transformer. Also derive the emf equation of transformer.
- Q.7) What is magnetic hysteresis and hysteresis loop ?
- Q.8) Draw the line diagram of a typical transmission and distribution system indicating the standard voltages.



Subject : COMPUTER PROGRAMMING

Course: B.Tech

Full Marks : 70

Time : 3 Hours

Pass Marks: 28

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PART A

Q.1). All questions are compulsory

A) Multiple Choice Questions :

(10x1=10)

- If an integer needs two bytes of storage then maximum value of an unsigned integer in
 - $2^{16} - 1$
 - $2^{15} - 1$
 - 2^{16}
 - 2^{15}
- Printf ("%d", printf ("tim"));
 - Result in a syntax error
 - Outputs tim3
 - Output garbage
 - printf tim and terminates abruptly
- if y is of integer type then the expressions $3*(y - 8) / 9$ and $(y - 8) / 9*3$
 - must yield the same value
 - must yield different values
 - may or may not yield the same value
 - none of the above
- $x -= y + 1$: does the same as
 - $x = x - y + 1$
 - $x = -x - y - 1$
 - $x = -x + y + 1$
 - $x = x - y - 1$
- The following program fragment
for (i = 1; i < 5; ++i)
if (I == 3) continue;
else printf ("%d", i);
Results in the printing of
 - 1 2 4 5
 - 1 2 4
 - 2 4 5
 - None of the above

- vi. The following program fragment
- ```

if (a=0)
printf ("a is zero")
else
printf ("a is not zero");

```
- result in the printing of
- a is zero
  - a is not zero
  - nothing
  - garbage
- vii. the following loop
- ```

for (I = 1, j = 10; I < 6; ++i, -- j)
printf ("%d %d", I,j);

```
- prints
- 1 10 2 9 3 8 4 7 5 6
 - 1 2 3 4 5 10 9 8 7 6
 - 1 1 1 1 1 9 9 9 9 9
 - None of the above
- viii. A possible output of the following program fragment
- ```

for (i = getchar () ; ; I = getchar())
if (I == 'x') break;
else putchar (i) ;

```
- is
- mi
  - mix
  - ix
  - None of the above
- ix. The program fragment
- ```

int a = 5, b = 2;
printf ("%d", a+++++b);

```
- 7
 - 8
 - 9
 - None of the above
- x. Consider the following program fragment.
- ```

int v = 3, *pv = &v;
printf ("%d %d", v, *pv);

```
- The output will be
- an error message
  - 3 address of v
  - 3 3
  - None of the above

(5x2=10)

### B] Very Short question

- What is nested loop?
- What is the use of getch() function?
- Which are relational operators?
- What is function? What is meant by Recursive function?
- How to initialize an array?



# ARKA JAIN University, Jharkhand

1<sup>st</sup> Semester Final Examination – 2018-19

Subject : Engineering Graphics

Time : 3 Hours

Course: B. Tech.

Full Marks : 70

Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question No. 1 is Compulsory.
- This Subject contains **Seven** questions out of which **Five** questions are to be answered.

Answer any FIVE questions out of which question no 1 is compulsory (1x10+4x15=70)

**Q.1)** Draw the projections of the following points on the same ground line, keeping the projectors 50mm apart.

A, 50 mm below the H.P. and 100 mm behind the V.P.

B, in the H.P. and 120 mm behind the V.P.

C, in the V.P. and 80 mm above the H.P.

D, 70 mm above the and 50 mm in front of the V.P.

E, 65mm above the H.P. and 60 mm behind the V.P.

F, 70mm below the H.P. and 65mm in front of the V.P.

**Q.2)** To construct an ellipse when its major axis is equal to 90 mm & Minor axis is equal to 60 mm by concentric method.

**Q.3)** A regular pentagon of 25 mm side has one side on the ground. Its plane is inclined at 45 degree to the H.P. and perpendicular to the V.P. Draw its Projection.

**Q.4)** a) Draw a scale of 1:60 to show m and dm and long enough to measure up to 6m. To show 3.7m on the line

b) Construct a diagonal scale of R.F. =1/4000 to show meters and long enough to measure up to 500 meters . To show 376 m on the line.

**Q.5)** The Top view of a 75 long line AB measures 65 mm, while the length of its front view is 50 mm. It's one end A is in the H.P. and 12mm in front of the V.P. Draw the projections of AB and determines its inclinations with the H.P. & V.P.

**Q.6)** A line AB , 65 mm long , has its end A 20mm above the H.P. and 25mm in front of the V.P. The end B is 40 mm above the H.P. and 65 mm in front of the V.P. Draw the projections of AB and determines its inclinations with the H.P. and V.P.

**Q.7)** Draw the lettering "ARKA JAIN UNIVERSITY " in capital & small letter with suitable scale.