GOVT. POLYTECHNIC, AMRAVATI.

(An Autonomous Institute of Govt. of Maharashtra)

Write Identity Code

TERM END EXAMINATION
SUMMER- 2019

PROGRAMME:DIPLOMA IN COMPUTER ENGINEERING/INFORMATION TECHNOLOGY

COURSE CODE & ITS TITLE: FC2404 ELECTRICAL TECHNOLOGY

Time Allowed : 03 Hrs **Marks: 70**

Instructions:

1. Write your Identity Code Number on question paper.
2. All questions are compulsory.
3. Illustrate your answers with neat sketches wherever necessary.
4. Use of non-programmable calculator is permissible.
5. Figures to the right indicate full marks.
6. Assume suitable additional data, - if necessary – and state the assumptions made.
7. Each sub-question in a question carries equal marks unless otherwise specified.

Marks

Q.1.A) Attempt any **THREE.** **06**

a) State Ohm's law.

b) Explain difference between potential difference and voltage drop.

c) Note various effects of current.

d) Write any four applications of Batteries.

B) Attempt any **ONE.** **04**

a) Calculate current in each resistance using KVL in the circuit ohm in fig.1.

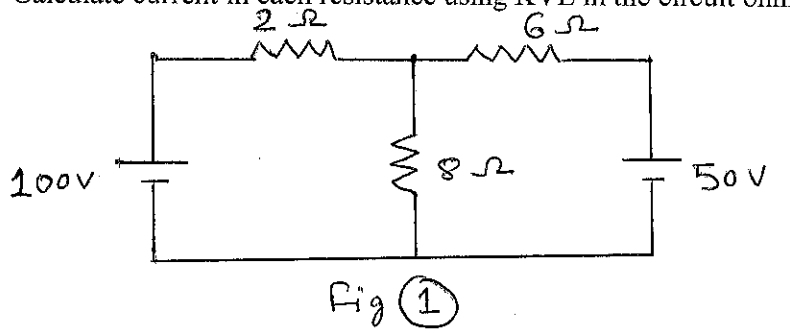

Fig (1)

b) Draw equivalent resistance between points A and B in the circuit ohm in fig.2.

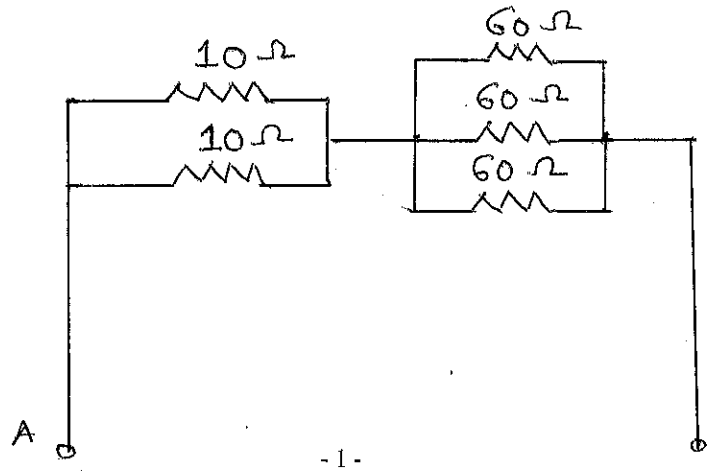

Fig (2)

Q.2. A) Attempt any **TWO.** **04**

a) Define each of the following terms –

Magnetic flux density, Reluctance.

b) Explain what is Mutual Inductance.

c) State Faraday's law of Electromagnetic Induction.

B) Attempt any **TWO.** **08**

a) Draw and explain a Hysteresis loop.

b) Explain each of the following –

i) Dynamically induced EMF. ii) Statically Induced EMF.

c) Compare Electric Circuit and Magnetic Circuit. (any four points)

Q.3. A) Attempt any **TWO.** **04**

a) Define each of following terms of AC fundamentals –

i) Frequency ii) Time Period.

b) Explain concept of Lagging Phase and Leading Phase by drawing suitable sinusoidal waveforms.

c) Draw Power Triangle.

B) Attempt any **TWO.** **08**

a) Calculate Impedance, Power Factor, Current, Active Power for a circuit consisting of Register of 10Ω in series with an Inductance of 0.1 H, Assume supply voltage as 200 V and Frequency as 50 Hz.

b) A sinusoidal voltage source is represented as $v = 400 \sin (314\,t - 30°)$ volt.

Calculate i) Frequency ii) Time Period. iii) RMS value iv) Phase.

c) Draw a circuit diagram showing connection of Three Phase Delta Connected with three phase supply. Show various line and phase quantities on it. Also write relationship between line and phase quantities.

Q.4. A) Attempt any **TWO.** **04**

a) Draw diagrams of Core Type Transformer and shell type Transformer.

b) A Transformer is designed for Full load regulation of 95%. Explain whether this transformer is good or bad.

c) Explain function of each of the following transformer in Electrical Engg.

i) Isolation Transformer ii) Welding Transformer.

B) Attempt any **TWO.** **08**

a) A single phase, 1 KVA, 230 V/115 V, transformer is used. Calculate.

i) Turns Ratio ii) Current Ratio iii) Full load primary winding current

iv) Full load secondary winding current.

b) Draw schematic diagram of each of the following.

i) DC shunt Motor ii) DC Series Motor

iii) DC compound motor.

c) Explain with diagram how current transformer and potential transformers are used for measuring current & potential.

Q.5. A) Attempt any **TWO.** **04**

a) Write different types of single phase Induction motor. Write any two application of each.

b) Write any four applications of Three phase Induction Motor.

c) Explain with diagram working principle of universal motor.

B) Attempt any **TWO.** **08**

a) Explain how direction of rotation of Universal motor can be reversed.

b) Write any four applications of each of the following.

i) Universal Motor ii) Stepper Motor.

c) Explain with diagram working of Permanent Magnet stepper Motor.

Q.6. A) Attempt any **TWO.** **04**

a) Write difference between ELCB and MCB (any two points).

b) Write any four factors on which type of wire is selected.

c) Explain why fuses are provided in electrical circuit.

B) Attempt any **TWO.** **08**

a) Explain why earthing is necessary in electrical equipment.

d) Write any four general safety rules in Electrical Engg.

e) State any four causes of Electric Fire.

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TERM END EXAMINATION
SUMMER- 2019

PROGRAMME: DIPLOMA IN CM/IF ENGINEERING

COURSE CODE & ITS TITLE: FC1408 APPLIED MATHEMATICS

Time Allowed : 03 Hrs **Marks: 70**

Instructions:
1. Write your Identity Code Number on question paper.
2. All questions are compulsory.
3. Illustrate your answers with neat sketches wherever necessary.
4. Use of non-programmable calculator is permissible.
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Marks

Q.1. A) Attempt any **TWO** **04**

a) If $f(x) = \frac{x^2+9}{\sqrt{x-3}}$ find $f(4) + f(5)$

b) Determine whether the function $f(x) = x^3 - 3x + sinx + xcosx$ is even or odd function.

c) If $f(x) = \frac{2x+5}{3x-4}$ and $t = \frac{5+4x}{3x-2}$ $show\ that\ f(t) = x$

B) Attempt any **THREE** **12**

a) Find $\frac{dy}{dx}; if\ y = \log(x.sin2x)$

b) If ; $x = a(\theta - sin\theta) and\ y = a(1 - cos\theta) find\ \frac{dy}{dx}$

c) Find ; $\frac{dy}{dx}$ $if\ y = xsinx + (tanx)^x$

d) Show that $\frac{dy}{dx} = \frac{y}{x}$ $if\ x^3y^2 = (x+y)^5$

Q.2. Attempt any **TWO.** **08**

a) Find the equation of tangent to the ellipse $2x^2 + 3y^2 = 5$ which is perpendicular to the line $3x + 2y + 7 = 0$

b) A metal wire 36cm long is bent to form a rectangle. Find its diamensions when its area is maximum.

c) Find the radius of curvature of the curve $\sqrt{x} + \sqrt{y} = 1$ at $\left(\frac{1}{4}, \frac{1}{4}\right)$

Q.3. A) Attempt any **TWO.** **04**

a) Find ; $\int \sqrt[3]{x}\ (x^2 + x - 1)dx$

b) Find ; $\int \frac{dx}{3x^2+4}$

c) Find ; $\int \frac{dx}{\sqrt{5-3x^2}}$

B) Attempt any **TWO** **08**

a) Solve ; $\int x.tan^{-1}x\,dx$

b) Find ; $\int \frac{dx}{4-5cosx}$

c) Find ; $\int \frac{x^2+x+3}{(x+2)(x^2+1)}\,dx$

Q.4. A) Attempt any **ONE.** **04**

a) Evaluate ; $\int_0^{\pi} \frac{1}{1+cotx}\,dx$

b) Evaluate ; $\int_1^5 \frac{\sqrt[3]{9-x}}{\sqrt[3]{9-x}+\sqrt[3]{x+3}}\,dx$

B) Attempt any **TWO** **08**

a) Find the area between parabola $y^2 = 8x$ and the straight line $y = 2x$

b) Find the area of enclosed by the curve y= $1 + x^3 + 2sinx\ from\ x = 0\ to\ x = \pi$.

c) Find the volume of right circular cone generated by revolving the line $y = 4x$ about x-axis between $x = 0$ and $x = 7$

Q.5. A) Find order and degree of different equation $\frac{d^2y}{dx^2} = \sqrt{y + \left(\frac{dy}{dx}\right)^2}$ 02

B) Attempt any **TWO** **08**

a) Solve ; $\frac{dy}{dx} + tanx.y = cos^2x$

b) A particle moves with acceleration (3-t)m/sec^2 with intial velocity 2 m/sec. find the velocity of the particle at the end of 5 sec.

c)Solve ; $sec^2x.tany\,dx + sec^2y.tanx\,dy = 0\ If\ y = \frac{\pi}{4}\ when\ x = \frac{\pi}{4}$

Q.6. Attempt any **THREE.** **12**

a) Find the approximate root of $x^3 + 2x - 1 = 0$ by using Bisection method (carry out three iterations only)

b) Solve the equations $x^3 + 2x^2 - 8 = 0$ by using Regula-Falsi method by two iterations.

c) Solve the equations $20x + y - 2z = 17\ ; 3x + 20y - z = 17\ and\ 2x - 3y + 20z = 17$ by using Gauss-seidal iteration method.

d) Find the approximate root of the $x^3 - x - 1 = 0$ by using Newton-Raphson method by taking initial root 1. (carry out two iterations)

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PROGRAMME: DIPLOMA IN CM/IF ENGINEERING

COURSE CODE & ITS TITLE: FC3401- PROGRAMMING IN 'C'

Time Allowed : 03 Hrs **Marks: 70**

Instructions:

1. Write your Identity Code Number on question paper.
2. All questions are compulsory.
3. Illustrate your answers with neat sketches wherever necessary.
4. Use of non-programmable calculator is permissible.
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Marks

Q.1.(A) Attempt any **ONE.** **02**

a) Define algorithm. Write any two advantages of algorithm.

b) Draw symbol for i) Processing ii) I/P and O/P

(B) Attempt any **TWO** **08**

a) Draw and explain any four symbols used in flowchart.

b) Write an algorithm to find area of rectangle.

c) Draw flowchart for the following algorithm.

Step 1 : Start

Step 2 : Input sides of triangle A,B,C

Step 3 : S=(A+B+C)/2.0

Step 4 : AREA=SQRT(S*(S-A)*(S-B)*(S-C))

Step 5 : PERIMETER=S1+S2+S3

Step 6 : Display AREA, PERIMETER

Step 7 : Stop

Q.2.(A). Attempt any **ONE.** **02**

a) Define Keyword. List any four Keywords used in 'C'.

b) List any four relational operators used in 'C'

(B). Attempt any **TWO** **08**

a) Describe unary operator with example.

b) Write C program to display largest number among three numbers.

c) Explain basic structure of C program.

Q.3.(A) Attempt any **TWO.** **04**

a) State need of loop statements.

b) Define for loop with syntax.

c) Define following terms

i)Break ii)Continue

(B). Attempt any **TWO** **08**

a) Describe switch-case statement with example.

b) Write C program to display the following series using while loop.

5 6 7 8 9 10

c) Write difference between while and do-while loop.

Q.4.(A) Attempt any **ONE.** **02**

a) Create structure "student" having members age and name.

b) Define union and write syntax for its declaration.

(B). Attempt any **THREE.** **12**

a) Describe strlen ( ) and strcmp ( ) function with their syntax.

b) Write C program to display the output as "welcome to C world" where S1= "Welcome" S2="to C world". Use proper string handling function S1, S2 are strings.

c) Explain arrays of structure with example.

d) Create structure "BOOK" having data members book name, book pages and book price accept this data and display information for one book.

Q.5.(A) Attempt any **TWO.** **04**

a) Enlist different categories of function.

b) List any four library function under math h header file.

c)Write need of user defined function.

(B). Attempt any **TWO.** **08**

a) Define recursion. Write any C program that makes use of recursion.

b) Write difference between call by value and call by reference (Any four points)

c)Write C program to exchange values of two variables by creating user defined function using call by value method.

Q.6.(A) Attempt any **TWO.** **04**

a) Define pointer. Write syntax to declare and initialize pointer.

b) Write syntax and use of FOPEN ( ) AND FSCAN ( )

c)Define dynamic memory allocation. Enlist functions used tin dynamic memory allocation.

(B). Attempt any **TWO.** **08**

a) Write advantages of using pointer.

b) Write C program that makes use of call by reference.

c)Write C program to print values of variables and their addresses using pointer.

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TERM END EXAMINATION
SUMMER- 2019

PROGRAMME:DIPLOMA IN COMPUTER ENGINEERING /INFORMATION TECHNOLOGY

COURSE CODE & ITS TITLE: FC3402 FUNDAMENTAL OF ELECTRONICS

Time Allowed : 03 Hrs **Marks: 70**

Instructions:

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Q.1. A) Attempt any **TWO.** **04**

a) List any four specification of capacitor.

b) Define inductor and draw symbol of inductor.

c) List types of signal.

B) Attempt any **TWO.** **08**

a) Differentiate between active and passive electronic components(any four points)

b) Calculate the time period of sine wave having frequency 10 KHz and 1 MHz.

c) Determine the resistance value of following colour code.

i)Red Green Red Silver. ii) Blue Violet Orange Gold.

Q.2. A) Attempt any **TWO.** **04**

a) Define depletion region and barrier potential of PN junction.

b) List any four applications of LED.

c) Draw the symbol of zener diode and photo diode.

B) Attempt any **TWO.** **08**

a) Explain the operating principle of P-N junction diode in forward biased condition.

b) Explain the mechanism of avalalancce breakdown in P-N junction diode.

c) Draw labelled V-I characteristics of a zener diode and explain.

Q.3. A) Attempt any **TWO.** **04**

a) Define the term rectifier.

b) List the various types of filter.

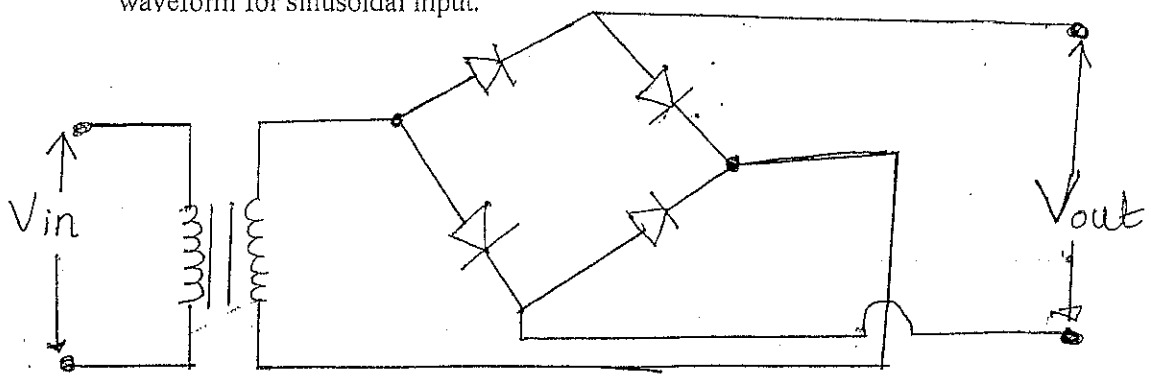
c) Define i) Ripple factor ii) Transformer Utilization Factor (TUF).

B) Attempt any **TWO.** 08

a) Draw the block diagram of DC power supply and describe its operation along with waveform at each block.

b) Explain half wave rectifier with shunt capacitor filter, also draw its input output waveform.

c) Identify the circuit shown in following fig. And explain working with input output waveform for sinusoidal input.



Q.4. A) Attempt any **ONE.** 02

a) State any four applications of BJT.

b) Draw a schematic symbol of PNP and NPN transistors.

B) Attempt any **THREE.** 12

a) Compare CE and CB configuration on the basis of i) input impedance ii) Output impedance iii) Current gain iv) Voltage gain.

b) Draw the circuit diagram of a transistor as a switch. Explain how the transistor work as a open switch in cut-off region and close switch in saturation region.

c) Derive the relation between α and β, and calculate the value of I_B, I_E of transistor having $\beta = 100$ and $I_c = 50$ mA.

d) Explain the working of single stage CE amplifier with the help of circuit diagram.

Q.5. A) Attempt any **ONE.** 02

a) State the classification of FET.

b) Draw the symbol of n-channel JFET.

B) Attempt any **TWO.** 08

a) The following readings are obtained experimentally form of FET.

V_{GS}	0 V	0V	-0.3 V
V_{DS}	7 V	14.5 V	14.5 V
ID	10 mA	10.25 mA	9.2 mA

Determine – i) AC drain resistance

ii) Transconductance

iii) Amplification factor.

b) Explain the construction of n-channel depletion type MOSFET with circuit diagram.

c) Compare BJT and JFET (any four points)

Q.6. A) Attempt any **ONE.** 02

a) List the types of Multivibrator.

b) State Barkhausen criterion for sustain oscillations.

B) Attempt any **TWO.** 08

a) Explain with waveform the operation of Astable multivibrator.

b) Find the operating frequency of transistor collpipp's oscillator if $C_1 = 0.001$ μF, $C_2 = 0.01$ μF and L = 15 μH

c) Explain the working of Hartley oscillator with circuit diagram.