

CBCS SCHEME

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21MAT31

Third Semester B.E. Degree Examination, June/July 2023 Transform Calculus, Fourier Series and Numerical Techniques

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Find the Laplace transform $2^t + \frac{\cos 2t + \cos 3t}{t}$ (06 Marks)
- b. Find the Laplace transform of the triangular wave of period $2c$ given by $f(t) = \begin{cases} t & 0 < t < c \\ 2c - t & c < t < 2c \end{cases}$ (07 Marks)
- c. Using convolution theorem find the inverse Laplace transform of $\frac{s}{(s^2 + a^2)^2}$ (07 Marks)

OR

- 2 a. Express the function $f(t)$ in terms of unit step function and hence find the Laplace transform of $f(t) = \begin{cases} \sin t & 0 < t < \pi \\ \sin 2t & \pi < t < 2\pi \\ \sin 3t & t \geq 2\pi \end{cases}$ (06 Marks)
- b. Find the inverse Laplace transform $\frac{2s^2 - 6s + 5}{(s-1)(s-2)(s-3)}$ (07 Marks)
- c. Solve the using Laplace transform method $y''(t) + 4y'(t) + 4y = e^{-t}$ $y(0) = 0$ $y'(0) = 0$ (07 Marks)

Module-2

- 3 a. Obtain the Fourier series of $f(x) = \frac{\pi - x}{2}$ in $0 < x < 2\pi$. Hence deduce that $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \dots = \frac{\pi}{4}$ (06 Marks)
- b. Obtain the half range cosine series for the function $f(x) = 2x - 1$ in $0 < x < 1$ (07 Marks)
- c. Obtain the Fourier series of y upto the first harmonic for the following values:

x°	45	90	135	180	225	270	315	360
y	4.0	3.8	2.4	2.0	-1.5	0	2.6	3.4

(07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. $42+8=50$, will be treated as malpractice.

OR

- 4 a. Obtain the Fourier series of $f(x) = x \cos x$ in the interval $-\pi \leq x \leq \pi$. (06 Marks)
 b. Obtain the sine half range Fourier series for the function,

$$f(x) = \begin{cases} \frac{2Kx}{\ell} & \text{in } 0 \leq x \leq \frac{\ell}{2} \\ \frac{2K}{\ell}(\ell - x) & \text{in } \frac{\ell}{2} \leq x \leq \ell \end{cases} \quad (07 \text{ Marks})$$

- c. Obtain the constant term and the first three coefficients in the Fourier cosine series of y in the following data :

x	0	1	2	3	4	5
y	4	8	15	7	6	2

(07 Marks)

Module-3

- 5 a. Find the complex Fourier transform of the function,

$$f(x) = \begin{cases} a^2 - x^2 & \text{for } |x| < a \\ 0 & \text{for } |x| > a \end{cases}$$

Hence evaluate $\int_0^{\infty} \left(\frac{\sin s - s \cos s}{s^3} \right) ds = \frac{\pi}{2}$. (06 Marks)

- b. Find the Fourier sine transform of e^{-ax} . (07 Marks)
 c. Find the z-transform of $\cos n\theta$ and $\sin n\theta$. (07 Marks)

OR

- 6 a. Find the Fourier cosine transform of the function, $f(x) = \begin{cases} 4x & 0 < x < 1 \\ 4 - x & 1 < x < 4 \\ 0 & x > 4 \end{cases}$. (06 Marks)

- b. Find the inverse z-transform of $\frac{2z^2 + 3z}{(z+2)(z-4)}$. (07 Marks)

- c. Solve by using z-transform $y_{n+2} - 4y_n = 0$ given that $y_0 = 0$ and $y_1 = 2$. (07 Marks)

Module-4

- 7 a. Classify the following partial differential equation

i) $\frac{\partial^2 u}{\partial x^2} + 4 \frac{\partial^2 u}{\partial x \partial y} + 4 \frac{\partial^2 u}{\partial y^2} - \frac{\partial u}{\partial x} + 2 \frac{\partial u}{\partial y} = 0$

ii) $x^2 \frac{\partial^2 u}{\partial x^2} + (1 - y^2) \frac{\partial^2 u}{\partial y^2} = 0$ $-\infty < x < \infty, -1 < y < 1$

iii) $(1 + x^2) \frac{\partial^2 u}{\partial x^2} + (5 + 2x^2) \frac{\partial^2 u}{\partial x \partial t} + (4 + x^2) \frac{\partial^2 u}{\partial t^2} = 0$

iv) $(x + 1) \frac{\partial^2 u}{\partial x^2} - 2(x + 2) \frac{\partial^2 u}{\partial x \partial y} + (x + 3) \frac{\partial^2 u}{\partial y^2} = 0$ (10 Marks)

- b. Find the values of $u(x, t)$ satisfying the parabolic equation $\frac{\partial^2 u}{\partial x^2} = 2 \frac{\partial u}{\partial t}$ and its boundary conditions $u(0, t) = 0 = u(4, t)$ and $u(x, 0) = x(4 - x)$ by taking $h = 1$ find the value up to $t = 5$. (10 Marks)

OR

- 8 a. Solve $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ in $0 < x < 5, t \geq 0$ given that $u(x, 0) = 20$ $u(0, t) = 0$ $u(5, t) = 100$ compute U for the time step $h = 1$ by Crank-Nicholson method. (10 Marks)
- b. Solve the wave equation $\frac{\partial^2 u}{\partial t^2} = 4 \frac{\partial^2 u}{\partial x^2}$ subject to the condition $u(0, t) = 0$ $u(4, t) = 0$ $u(x, 0) = 0$ and $u(x, 0) = x(4 - x)$ by taking $h = 1, K = 0.5$ up to four steps. (10 Marks)

Module-5

- 9 a. Given $\frac{d^2 y}{dx^2} - x^2 \frac{dy}{dx} - 2xy = 1, y(0) = 1, y'(0) = 0$ evaluate $y(0.1)$ using Runge-Kutta method of order 4. (06 Marks)
- b. Derive the Euler's equation of the form $\frac{\partial t}{\partial y} - \frac{d}{dx} \left(\frac{\partial t}{\partial y_1} \right) = 0$. (07 Marks)
- c. Find the extremal of the functional $I = \int_0^{\pi/2} (y^2 - y'^2 - 2y \sin x) dx$ under the conditions $y(0) = y(\pi/2) = 0$. (07 Marks)

OR

- 10 a. Apply Milne's predictor-corrector method to solve $\frac{d^2 y}{dx^2} = 1 - 2y \frac{dy}{dx}$ at 0.8 given that $y(0) = 0, y(0.2) = 0.02, y(0.4) = 0.0795, y(0.6) = 0.1762,$
 $y'(0) = 0, y'(0.2) = 0.1996, y'(0.4) = 0.3937, y'(0.6) = 0.5689$. (06 Marks)
- b. Show that the geodesics on a plane are straight lines. (07 Marks)
- c. Which curve the functional $\int_0^{\pi/2} (y'^2 - y^2 + 2xy) dx, y(0) = 0, y(\pi/2) = 0$ be extremized. (07 Marks)

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Third Semester B.E. Degree Examination, June/July 2023 Digital System Design Using Verilog

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define combinational logic circuit and place the following equation into the proper canonical form,
 - (i) $P = f(a, b, c) = a\bar{b} + a\bar{c} + bc.$
 - (ii) $Q = f(a, b, c) = (a + \bar{b})(\bar{b} + c)$
 - (iii) $Z = f(a, b, c, d) = (a + \bar{b})(a + \bar{b} + d)$ (10 Marks)
- b. Find all the prime implicants of the function using Quine-McClusky method.
 $Z = f(a, b, c, d) = \sum m(7, 9, 12, 13, 14, 15) + d(4, 11)$ (10 Marks)

OR

- 2 a. Simplify the following expression using K-map. Implement the simplified expression using basic gates only $F = f(a, b, c, d) = \sum m(0, 1, 2, 5, 6, 7, 8, 9, 10, 13, 14, 15).$ (10 Marks)
- b. Design a logic circuit that has 4 inputs, the output will be high when the majority of the inputs are high. Use K-map to simplify. (10 Marks)

Module-2

- 3 a. Implement the following Boolean function using 8 : 1 multiplexer and 4 : 1 multiplexer.
 $M = f(a, b, c, d) = \sum m(0, 1, 2, 4, 6, 9, 12, 14)$ (10 Marks)
- b. Explain 4-bit carry look ahead adder with neat diagram and relevant expressions. (10 Marks)

OR

- 4 a. Implement full adder and full subtractor using 74138 decoder. (10 Marks)
- b. Design 2-bit magnitude comparator. (10 Marks)

Module-3

- 5 a. Explain Master Slave JK flip flop with the help of circuit diagram and waveforms. (10 Marks)
- b. Design a mod-6 synchronous counter using JK flip flop. (10 Marks)

OR

- 6 a. Find characteristic equations for SR, T, D and JK flip flop with the help of function table. (10 Marks)
- b. Explain four bit binary ripple counter with logic and timing diagram. (10 Marks)

Module-4

- 7 a. List all the data types available in verilog HDL and explain any three data types with examples. (10 Marks)
- b. Explain various descriptive styles available for hardware modeling using verilog HDL with an example. (10 Marks)

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OR

- 8 a. Explain the different types of logical operators with an example program. (10 Marks)
b. Write a full subtractor verilog program using dataflow type of description. (10 Marks)

Module-5

- 9 a. With a neat block diagram, explain the components of a verilog module by highlighting mandatory blocks. (10 Marks)
b. Write a verilog behavioural code for 4 to 1 multiplexer using case statement. (10 Marks)

OR

- 10 a. Write a verilog structural code for four bit ripple carry adder. (10 Marks)
b. Explain the highlights of structural description with an example. (10 Marks)

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Third Semester B.E. Degree Examination, June/July 2023

Basic Signal Processing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define vector space and list out the eight rules that satisfies addition and scalar multiplication. (05 Marks)
- b. For which right hand side vector (b_1, b_2, b_3) have solution to the system.
- $$\begin{bmatrix} 1 & 4 & 2 \\ 2 & 8 & 4 \\ -1 & -4 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \end{bmatrix} \quad (08 \text{ Marks})$$
- c. Define column space and null space of the matrix. (07 Marks)

OR

- 2 a. Determine the complete solution $x = x_n + x_p$ to the system
- $$\begin{bmatrix} 1 & 2 & 2 \\ 2 & 4 & 5 \end{bmatrix} \begin{bmatrix} u \\ v \\ w \end{bmatrix} = \begin{bmatrix} 1 \\ 4 \end{bmatrix} \quad (05 \text{ Marks})$$
- b. Find the best straight line fit (least square) to the measurement $b = 4$ at $t = -2$, $b = 3$ at $t = -1$, $b = 1$ at $t = 0$ and $b = 0$ at $t = 2$. Then find the projection of b on to the column space of A (08 Marks)
- c. Apply the Gram – Schmidt process for the independent vectors
- $$a = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}, b = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, c = \begin{bmatrix} 2 \\ 1 \\ 0 \end{bmatrix} \text{ to obtain an orthonormal basis.} \quad (07 \text{ Marks})$$

Module-2

- 3 a. Find the eigen values and eigen vectors of $A = \begin{bmatrix} 3 & 4 & 2 \\ 0 & 1 & 2 \\ 0 & 0 & 0 \end{bmatrix}$. Check that $\lambda_1 + \lambda_2 + \lambda_3$ equals the trace and $\lambda_1 \lambda_2 \lambda_3$ equals the determinant. (08 Marks)
- b. For the matrix $A = \begin{bmatrix} 1 & -1 \\ 2 & 4 \end{bmatrix}$, solve the differential equation $\frac{du}{dt} = Au, u(0) = \begin{bmatrix} 0 \\ 6 \end{bmatrix}$. What are the two pure exponential solutions? (12 Marks)

OR

- 4 a. If $A = \begin{bmatrix} 4 & 2 & -2 \\ -5 & 3 & 2 \\ -2 & 4 & 1 \end{bmatrix}$ and eigen vector matrix $S = \begin{bmatrix} 2 & 1 & 0 \\ 1 & 1 & 1 \\ 4 & 2 & 1 \end{bmatrix}$. Determine the diagonalization matrix $\Lambda = S^{-1}AS$ (08 Marks)

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- b. For the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 6 \end{bmatrix}$, find the eigen values, eigen vector v_1, v_2 and $A^T A$. Then find u_1, u_2 and recover A using Singular Value Decomposition (SVD). (12 Marks)

Module-3

- 5 a. Define signals and systems. (04 Marks)
 b. $x(n) = [2, 2, 2, 2, -2, -2, -2, -2]$. Sketch i) $x(n-3)$ ii) $x(2n+3)$. (06 Marks)
 c. Determine whether the system $y(n) = nx(n)$ is
 i) Stable
 ii) Memory
 iii) Causal
 iv) Time invariant
 v) Linear (10 Marks)

OR

- 6 a. Sketch the signal $x(n) = u(n+10) - 2u(n) + u(n-6)$
 $y(n) = 2n[u(n) - u(n-6)]$ (10 Marks)
 b. Sketch the following signals
 i) $x(2n)$
 ii) $x(3n-1)$
 iii) $x(n)u(1-n)$ if $x(n) = [3, 2, 1, 0, 1, 2, 3]$ (10 Marks)

Module-4

- 7 a. Derive an expression for convolution sum for Linear Time Invariant (LTI) system. (04 Marks)
 b. Compute $y(n) = u(n) * u(n)$ using graphical method. (08 Marks)
 c. Compute $y(n) = x(n) * h(n)$, where $x(n) = u(n)$ and $h(n) = \left(\frac{3}{4}\right)^n u(n)$ using graphical method. (08 Marks)

OR

- 8 a. Show that convolution possesses the associative and distributive property. (08 Marks)
 b. For the impulse response $h(n) = 2u(n) - 2u(n-5)$. Determine whether the system
 i) Memoryless
 ii) Stable
 iii) Causal (06 Marks)
 c. What is step response? Evaluate the step response of the LTI system whose impulse response is $h(n) = \left(\frac{1}{2}\right)^n u(n)$. (06 Marks)

Module-5

- 9 a. Find the z-transform and mention ROC of the following signals
 i) $x(n) = [1, 2, 3, 4, 0, 7]$
 ii) $x(n) = [1, 2, 3, 4, 0, 7]$
 iii) $x(n) = [1, 2, 3, 4, 0, 7]$ (03 Marks)

- b. Find the z-transform of the signal $x(n) = a^n u(-n-1)$ with ROC diagram. (05 Marks)
- c. Using the properties of the z-transform, find the z-transform of the following signals
- $x(n) = a^n \cos \Omega_0 n u(n)$
 - $x(n) = u(n-2) * \left(\frac{2}{3}\right)^n u(n)$ (12 Marks)

OR

- 10 a. Using partial fraction expansion method find the inverse z-transform of

$$x(z) = \frac{1 - z^{-1} + z^{-2}}{\left(1 - \frac{1}{2}z^{-1}\right)(1 - 2z^{-1})(1 - z^{-1})} \text{ for}$$

i) ROC $1 < |z| < 2$

ii) ROC $\frac{1}{2} < |z| < 2$

iii) ROC $|z| < \frac{1}{2}$

(08 Marks)

- b. A causal system has an input $x(n] = \delta(n) + \frac{1}{4}\delta(n-1) + \frac{1}{8}\delta(n-2)$ and output

$$y(n) = \delta(n) - \frac{3}{4}\delta(n-1). \text{ Find the transfer function of the system.}$$

(04 Marks)

- c. The LTI system is $H(z) = \frac{3 - 4z^{-1}}{1 - 3.5z^{-1} + 1.5z^{-2}}$. Specify ROC of $H(z)$ and determine $h(n)$ for

the following conditions

i) The system is stable

ii) The system is causal

iii) The system is anticausal

(08 Marks)

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Third Semester B.E. Degree Examination, June/July 2023 Analog Electronic Circuits

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the classical biasing for BJTs using a single power supply with circuit and relevant equations. How is bias current stabilized? (08 Marks)
- b. Design collector-to-base feedback resistor circuit to obtain a dc emitter current of 1mA and to ensure $V_{CE} = 2.3V$. Let $V_{CC} = 10V$ and $\beta = 100$. (04 Marks)
- c. Considering the conceptual circuit of common emitter amplifier, derive the expression for small-signal input resistance between base and emitter resistance. Mention the relation between r_{π} and r_e . (08 Marks)

OR

- 2 a. Why biasing by fixing V_{GS} is not a good approach? Explain biasing by fixing V_G and connecting a resistance in the source. (10 Marks)
- b. Design Drain-to-Gate feedback resistor biasing circuit to operate at a dc drain current of 0.5mA. Assume $V_{DD} = 5V$, $K'_n W/L = 1mA/V^2$, $V_t = 1V$ and $\lambda = 0$. Use standard value for R_D and give actual values obtained for I_D and V_D . (06 Marks)
- c. A BJT having $\beta = 100$ is biased at a dc collector current of 1mA. Find the value of g_m , r_e and r_{π} . Assume $V_T = 25mV$. (04 Marks)

Module-2

- 3 a. Obtain the expression for characteristic parameters of the CS amplifier with circuit diagram and its equivalent circuit. (08 Marks)
- b. A CS amplifier utilizes a MOSFET biased at $I_D = 0.25mA$ with $V_{OV} = 0.25V$ and $R_D = 20K\Omega$. The device has $V_A = 50V$. The amplifier is fed with a source having $R_{sig} = 100K\Omega$ and a 20-K Ω load is connected to the output. Find R_{in} , A_{vo} , R_o , A_v and G_v . (05 Marks)
- c. Explain the internal capacitances of a MOSFET and hence draw the high frequency small signal model of MOSFET. (07 Marks)

OR

- 4 a. Find the mid band gain A_M and the upper 3-dB frequency f_H of a CS amplifier fed with a signal source having an internal resistance $R_{sig} = 100K\Omega$. The amplifier has $R_G = 4.7M\Omega$, $R_D = R_L = 15K\Omega$, $g_m = 1mA/V$, $r_0 = 150K\Omega$, $C_{gs} = 1pF$ and $C_{gd} = 0.4pF$. (06 Marks)
- b. Explain the working of FET – based RC phase shift oscillator with circuit diagram. In an RC phase shift oscillator, $R = 200K\Omega$ and $C = 200pF$. Find the frequency of the BJT-based oscillator. (08 Marks)
- c. Explain the working of clapp oscillator with a circuit diagram. (06 Marks)

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Module-3

- 5 a. Explain general feedback structure of the feedback amplifier with a signal flow diagram and mathematical expressions. (08 Marks)
- b. Explain noise reduction with the application of negative feedback in amplifiers. (08 Marks)
- c. A class B push-pull amplifier is supplied with $V_{CC} = 50V$. The signal brings the collector voltage down to $V_{min} = 5V$. The total dissipation from both transistors is 40W. Find the total power and conversion efficiency. (04 Marks)

OR

- 6 a. Explain transconductance amplifier with a neat block diagram. (06 Marks)
- b. Explain class-B transformer-coupled amplifier. Prove that the maximum conversion efficiency of a class B transformer coupled amplifier is 78.5%. (08 Marks)
- c. Explain class C output stage with a neat diagram. (06 Marks)

Module-4

- 7 a. Explain inverting amplifier with external offset null circuit and relevant expressions for output voltage and closed loop gain. (07 Marks)
- b. Explain successive-approximation type A/D converter with a neat diagram. (07 Marks)
- c. Explain positive small-signal half-wave rectifier circuit with waveforms. (06 Marks)

OR

- 8 a. Explain the working of a second order high pass Butterworth filter with a neat circuit diagram and frequency response. Write the relevant design equations. (08 Marks)
- b. Design second order low-pass filter at a high cutoff frequency of 1kHz. Choose capacitance value $0.0047\mu F$. (05 Marks)
- c. Explain the operation of 555 timer as astable multivibrator with relevant expressions. (07 Marks)

Module-5

- 9 a. Explain the classification of power electronic converters. (06 Marks)
- b. With the help of elementary circuit and static V-I characteristics, explain the three regions of operation of the SCR. (08 Marks)
- c. Explain class-A commutation with necessary circuit diagram and waveforms. (06 Marks)

OR

- 10 a. Write a note on basic requirements for the successful firing of a thyristor. (04 Marks)
- b. Explain RC firing circuit with necessary circuit diagram and waveform. Write the relevant design equations. (08 Marks)
- c. Explain UJT relaxation oscillator with a neat circuit diagram. Derive the expression for frequency of oscillation. (08 Marks)

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Question Paper Version : C

Third/Fourth Semester B.E. /B.Tech. Degree Examination, June/July 2023

CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS

[Time: 1 hrs.]

[Max. Marks: 50]

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the Fifty questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

1. The member to be nominated by the President for the council of states are from,
a) Literature b) Science c) Sports d) All of these
2. Which of the following Pairs is not property matched ,
a) 44th Amendment-citizenship act b) 52nd Amendment-Anti Defection Law
c) 42nd Amendment-Fundamental duties d) 73rd Amendment-Local self Government
3. The speaker of Lok Sabha,
a) is appointed by the President b) is nominated by the Vice-President
c) is chosen by the members of Lok Sabha d) is elected by the members of parliament
4. Financial Emergency has been imposed in India,
a) Once b) Never c) Twice d) Thrice
5. Respect for the National Flag and the National Anthem is,
a) a Fundamental right b) a Fundamental Duty
c) a Directive principle d) an ordinary duty
6. A non-member of the state legislature can be the minister for a period not exceeding,
a) Six month b) One year c) Six weeks d) Three months
7. Engineering ethics is a,
a) developing ethics b) Preventive ethics
c) natural ethics d) Scientifically developed ethics
8. Risk estimation can be done by using,
a) Cooking b) Trimming c) Event tree d) Both (a) and (b)

9. The Patent holder does not allow others to use patented information for _____ years from the date of filing.
a) 25 b) 30 c) 50 d) 20
10. The use of intellectual property of others without their permission or credit is referred to as,
a) Cooking b) Plagiarism c) Patents d) Formulae
11. When was the Indian constitution enacted and adopted?
a) 26/10/1949 b) 26/11/1949 c) 26/4/1949 d) 26/01/1950
12. 'We the people of India' are the opening words of the,
a) Preamble of the Indian constitution b) Article 21 of the Indian constitution
c) Fundamental rights d) Directive principles of state policy
13. Which one of these is the primary source of the Indian constitution?
a) British constitution b) Irish constitution
c) Charter Act of 1833 d) Government of India Act of 1935
14. The original Indian constitution had :
a) 12 parts, 6 schedule and 320 Articles b) 20 parts, 8 schedule and 380 Articles
c) 12 parts, 8 schedule and 396 Articles d) 12 parts, 10 schedule and 300 Articles
15. The word 'Sovereign' means that,
a) Supreme in nature b) A country is under dictatorship
c) A country is poor of weak d) A country is strong and powerfull
16. Directive principles are,
a) Justiciable b) Not practiced at rural levels
c) Non-justiciable d) Associated to the Government worker's
17. How much time was taken for training the constitution?
a) 1 year, 11 months, 18 days b) 5 year, 11 months, 18 days
c) 2 year, 11 months, 18 days d) 3 year, 11 months, 18 days
18. India is a Sovereign, socialist, selular, democratic and republic in the Indian constitution this expression occurs in,
a) Citizenship b) Preamble
c) Fundamental rights d) Directive principles
19. Who among the following is the supreme commander of the Armed forces?
a) Air Chief Marshal b) Prime Minister
c) Defense Minister d) President
20. The 91st Amendment Act (2003) is associated with,
a) Size of the council of ministers b) Primary education
c) Fundamental Duty d) Powers of the President
21. Which of the following is not the concept of responsibilities?
a) Minimalist b) Reasonable care c) Utilitarianism d) Good works
22. Lying means,
a) Intentionally conveying false information to others b) Fabrication
c) Plagarism d) All of these

23. The three types of Justice referred in our preamble are :
 a) Social, Economic and Religious b) Social, Economic and Natural
 c) Social, Economic and International d) Social, Economic and Political
24. An arrested person must be produced before a magistrate within _____ hours of arrest.
 a) 12 b) 24 c) 36 d) 48
25. Election commission conducts the election as per which act?
 a) Parliament act b) People's representative act of 1982
 c) Code of conduct act d) State representative act
26. When the office of the president, falls vacant, the same must be filled up with in?
 a) 3 months b) 6 months c) 1 year d) 9 months
27. Who among the following are not entitled to form Union or Association,
 a) Police b) Teachers c) Workers d) Doctors
28. The MLA's of various state legislative assemblies are varying between,
 a) 40 to 450 b) 50 - 500 c) 28 - 12 d) 60 - 500
29. A bill cannot become an act of parliament, unless and until _____?
 a) it is passed by Lok Sabha b) it is passed by Rajya Sabha
 c) it gets assent from President d) it gets approved by Supreme Court
30. Who hoisted the National Flag during 74th Republic day function in New Delhi?
 a) Prime Minister b) President
 c) Vice-President d) Chief justice of India
31. The tenure of the Council of state is,
 a) Not subject to dissolution b) 2 years c) 5 years d) 4 years
32. When elections are held in one or a few constituencies due to death or resignation of candidates, it is called as _____.
 a) General election b) Primary election
 c) By election d) Midterm election
33. Fundamental Rights are borrowed from the constitution of,
 a) UK b) USA c) Germany d) Ireland
34. What is the minimum age to become Judges of Supreme Court of India?
 a) 25 years b) 30 years c) 35 years d) None of these
35. The Indian constitution gives the power of amending the constitution to,
 a) The people of India b) The president
 c) The Parliament d) Supreme Court of India
36. Right to Education (RTE) was introduced in _____ Amendment,
 a) 86th b) 42nd c) 44th d) 61st
37. How many types of writs can be issued by the Supreme Court for the protection of Fundamental Rights?
 a) Four b) Five c) One d) Six

38. Who presides over the sessions of Rajya Sabha?
a) Speaker b) Home minister c) Vice-president d) President
39. Who appoints the Vice-Chancellors of the state universities?
a) Education minister b) District commissioner c) Chief minister d) Governor
40. Election commission is a _____ body and the term of election commission is _____ years or _____ years of age whichever is earlier.
a) Uni-member, 4 years or 62 years b) Multi-member, 6 years or 65 years
c) Constitutional body, 5 years or 60 years d) None of these
41. How many members were nominated to the parliament by the president of India?
a) 14 members b) 12 members c) 2 members d) 6 members
42. Who among the following distribute portfolios for the council of minister,
a) President b) Vice president c) Prime Minister d) Speaker of Lok Sabha
43. The chief justice and other judges of the supreme court hold office till they complete,
a) Sixty years b) Sixty five years c) Sixty two years d) Seventy years
44. The council of ministers are responsible to the,
a) Rajya Sabha b) Vidhan Parshid c) Lok Sabha d) Supreme court
45. The Vice-President of India is elected by the,
a) Judges of the supreme court b) President
c) Prime Minister d) Members of parliament
46. Who can issue ordinance when the parliament is not in session:
a) President b) High court judges c) Home minister d) Finance minister
47. In case of the violation of the Fundamental Rights we may approach the,
a) Civil Courts b) Supreme Court c) High Court d) Both (a) and (b)
48. Which of the following equalities is/are included in the Right to Equality?
a) Equality before law b) Equal protection of law
c) Equal opportunities in the public employment d) All of these.
49. Prohibition of trafficking in human beings and forced labour comes under which of the following fundamental right?
a) Right to freedom b) Right against exploitation
c) Cultural & Educational Right d) Right to equality.
50. There is no provision in the constitution for the impeachment of the,
a) President b) Vice President c) Governor d) Supreme court Judges

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