



**MADE EASY**

India's Best Institute for IES, GATE & PSUs

# UPPSC-2019

UTTAR PRADESH

PUBLIC SERVICE COMMISSION 2019

**Assistant Engineer**

**Electrical Engineering**

**PAPER-II**

Exam held on 13-12-2020

Scroll down for  
Questions and Answer Keys

[www.madeeasy.in](http://www.madeeasy.in)

**Corporate Office:** 44-A/1, Kalu Sarai, New Delhi - 110016 | **Ph:** 011-45124612, 9958995830

Delhi | Hyderabad | Noida | Bhopal | Jaipur | Lucknow | Indore | Pune | Bhubaneswar | Kolkata | Patna

# UPPSC AE - 2019

## Electrical Engineering | Assistant Engineer

Exam held on 13-12-2020

**Q.1** A large tank near Mahoba, temples at Ajaygarh and Mahoba and city of Rajavasini were built by a Chandella King

- (a) Nannuk (b) Vakpati  
(c) Rahil (d) Jayashakti

**Ans. (c)**

**Q.2** Which of the following Rights a cultivator enjoyed on his own land during the Mughal period?

- (a) Right to mortgage only  
(b) Right to sell and gift  
(c) Right to mortgage and gift  
(d) All the above rights

**Ans. (c)**

**Q.3** Match **List-I** with **List-II** and select the correct answer using the code given below.

<b>List-I (Tribes)</b>	<b>List-II (States)</b>
(A) Tharus	1. Madhya Pradesh
(B) Todas	2. Jharkhand
(C) Santhal	3. Uttarakhand
(D) Gond	4. Tamil Nadu

**Code:**

- |     | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|-----|----------|----------|----------|----------|
| (a) | 1        | 3        | 4        | 2        |
| (b) | 4        | 2        | 1        | 3        |
| (c) | 2        | 1        | 3        | 4        |
| (d) | 3        | 4        | 2        | 1        |

**Ans. (d)**

**Q.4** Match **List-I** with **List-II** and choose the correct answer using the code given below:

**List-I (Text)**

- (A) Kiratarjunyam  
(B) Dashakumar Charitam  
(C) Buddha Charitam  
(D) Vikramorvashiyam

**List-II (Writer)**

1. Dandi  
2. Kalidas  
3. Bharavi  
4. Ashvaghosha

**Code:**

- |     | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|-----|----------|----------|----------|----------|
| (a) | 3        | 4        | 1        | 2        |
| (b) | 3        | 1        | 4        | 2        |
| (c) | 2        | 3        | 1        | 4        |
| (d) | 1        | 3        | 2        | 4        |

**Ans. (b)**

**Q.5** Match **List-I** with **List-II** and choose the correct answer using the code given below:

**List-I (Text)**

- (A) Nokrek  
(B) Agasthyamalai  
(C) Nandadevi  
(D) Dehang Debang

**List-II (Writer)**

1. Uttarakhand  
2. Arunachal Pradesh  
3. Kerala  
4. Meghalaya

**Code:**

- |     | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|-----|----------|----------|----------|----------|
| (a) | 4        | 3        | 1        | 2        |
| (b) | 4        | 3        | 2        | 1        |
| (c) | 3        | 4        | 1        | 2        |
| (d) | 2        | 3        | 4        | 1        |

**Ans. (a)**

**Q.6** States get share of the revenue from

- (a) Income Tax  
(b) Customs Revenue  
(c) Excise Tax  
(d) Surcharge on Income Tax

**Ans. (c)**

**Q.7** Which Article of the Indian Constitution empowers Parliament to make law for implementing international agreements?

- (a) Article 249      (b) Article 250  
(c) Article 252      (d) Article 253

**Ans. (d)**

**Q.8** Who appoints the acting Chief Justice of India?

- (a) Chief Justice of India  
(b) Chief Justice of India with previous consent of the President  
(c) President of India  
(d) President in consultation with the Chief Justice of India

**Ans. (c)**

**Q.9** The rotation intensity of Maize-Mustard-Mung crop is

- (a) 100%              (b) 200%  
(c) 300%              (d) 400%

**Ans. (c)**

**Q.10** Which of the following is NOT a Kharif crop?

- (a) Soyabean          (b) Lentil  
(c) Cotton              (d) Pigeon pea

**Ans. (b)**

**Q.11** 'Five Star Village Scheme' started by Government of India in September 2020 relates to which one of the following?

- (a) Electricity Supply  
(b) Postal Service Schemes  
(c) Health Services  
(d) Primary Education

**Ans. (b)**

**Q.12** Who won the US Open 2020, Mens Tennis Singles Title on 14th September, 2020?

- (a) Alex Zverev      (b) Dominic Thiem  
(c) D. Medvedev    (d) P.C. Busta

**Ans. (b)**

**Q.13** Which of the following pairs is NOT correctly matched?

Ancient name of the cities	Modern name of the cities
(a) Esipattan	– Saranath
(b) Dashapur	– Mandisor
(c) Banvasi	– Talkad
(d) Mahoday	– Kannauj

**Ans. (a)**

**Q.14** The early farming site located on the bank of lake is

- (a) Mehargarh          (b) Lahuradeva  
(c) Chirand              (d) T. Narsipur

**Ans. (c)**

**Q.15** Author of the 'Dastane Mazahib' which discusses about the Din-i-Ilahi of Akbar, was

- (a) Mohammad Rabbani  
(b) Mohsin Faani  
(c) Badauni  
(d) Afif

**Ans. (b)**

**Q.16** Who was appointed the Minister of 'Ministry of Rehabilitation' set up on 06 September, 1947?

- (a) S.P. Mukerji  
(b) Sardar Vallabhabhai Patel  
(c) J.L. Nehru  
(d) K.C. Niyogi

**Ans. (d)**

**Q.17** Match List-I with List-II and select the correct answer using the code given below:

List-I (States)	List-II (Highest Peaks)
(A) Tamil Nadu	1. Dhoopgarh
(B) Rajasthan	2. Saramati
(C) Nagaland	3. Guru Shikhar
(D) Madhya Pradesh	4. Doda Betta

**Code:**

	A	B	C	D
(a)	3	4	1	2
(b)	1	2	4	3
(c)	4	3	2	1
(d)	2	1	3	4

**Ans. (c)**

- Q.18** 'Leopold Matrix' is associated with  
(a) Weather Forecasting  
(b) Disaster Management  
(c) Environmental Impact Assessment Method  
(d) Environment Law

**Ans. (c)**

- Q.19** The Joint Sitting of the Indian Parliament for transacting a legislative business is presided over by  
(a) The President of India  
(b) The senior most Member of Parliament  
(c) The Chairman of the Rajya Sabha  
(d) The Speaker of the Lok Sabha

**Ans. (d)**

- Q.20** The term 'Office of Profit' has been defined by the  
(a) Constitution  
(b) Parliament  
(c) Supreme Court  
(d) Union Council of Ministers

**Ans. (c)**

- Q.21** While deciding any question relating to the disqualification of a Member of Parliament, the President shall obtain the opinion of  
(a) Election Commission  
(b) Chief Justice of India  
(c) Attorney General  
(d) Speaker of the Lok Sabha

**Ans. (a)**

- Q.22** Soyabean seed contains  
(a) 20% protein and 40% oil  
(b) 40% protein and 10% oil  
(c) 40% protein and 20% oil  
(d) 20% protein and 20% oil

**Ans. (c)**

- Q.23** As per the results of 'Swachh Sarvekshan 2020', announced by Ministry of Housing and Urban Affairs on 20th August 2020, which is the Cleanest City in Uttar Pradesh?

- (a) Agra (b) Gaziabad  
(c) Lucknow (d) Prayagraj

**Ans. (c)**

- Q.24** How many teachers from Uttar Pradesh were selected for 'National Award' on Teachers day 5th Sept., 2020?  
(a) Six (b) Five  
(c) Four (d) Three

**Ans. (d)**

- Q.25** 'Poshan Maah' was celebrated by Government of India in the year 2020, in which of the following months?  
(a) September (b) August  
(c) July (d) June

**Ans. (a)**

- Q.26** In a single phase induction motor, the reason for having high resistance rotor is to achieve  
(a) Reduce size (b) Low starting torque  
(c) High efficiency (d) High acceleration

**Ans. (d)**

- Q.27** BLDC motor is analogous to  
(a) Permanent magnet synchronous motor  
(b) DC motor  
(c) Rotating transformer  
(d) Single phase induction motor

**Ans. (a)**

- Q.28** In a Squirrel cage rotor, the bars are NOT placed parallel to the shaft, but are skewed to have  
(a) Greater mechanical strength  
(b) Less rotor losses  
(c) Uniform torque  
(d) None of the above

**Ans. (c)**

- Q.29** The presence of a dominant 7th harmonics in the winding distribution of 3-phase, 6-pole, 50 Hz, induction motor may cause the motor to crawl at a speed of about  
(a) 750 rpm (b) 143 rpm  
(c) 243 rpm (d) 500 rpm

**Ans. (b)**



**MADE EASY**  
India's Best Institute for IES, GATE & PSUs

Under the leadership of  
**Mr. B. Singh**  
Chairman &  
Managing Director



# LIVE CLASSES

at **MADE EASY PRIME**

EXPERIENCE  
CLASSROOM LEARNING AT HOME

## **ESE+GATE 2022 & GATE 2022**

- ✓ Live classes by India's top faculties (Fixed schedule of 3 hrs/day).
- ✓ Additional facility to watch recorded lectures with doubt clearing facility.
- ✓ Teaching pedagogy exactly similar to classroom course.
- ✓ Concept practice with workbooks and updated theory books.
- ✓ Assessment of performance through subject-wise tests.
- ✓ Systematic subject sequence and time bound completion of syllabus.

### Evening Batch

**28<sup>th</sup> Dec, 2020**  
5.30 PM - 8.30 PM

### Morning Batch

**18<sup>th</sup> Feb, 2021**  
8.30 AM - 11.30 AM

**EMI** Options  
available



8851176822, 9958995830



[www.madeeasyprime.com](http://www.madeeasyprime.com)

**MADE EASY** is  
*Celebrating*  
**20 Years**  
of **Excellence**



Offer valid till  
**27<sup>th</sup> Dec, 2020**

**OFFLINE CLASSES (Regular and Weekend)** commencing from **21<sup>st</sup> Feb, 2021**

If covid condition does not improve, then candidates will get access to live/online classes, till resumption of offline classes.

011-45124612, 9958995830



[www.madeeasy.in](http://www.madeeasy.in)

**Q.30** A synchronous motor installed at the receiving end substation operates with such an excitation that it takes power at lagging power factor. Now if the applied voltage of the synchronous motor goes down, the power factor of synchronous motor will

- (a) Remain constant
- (b) Go down
- (c) Be improved
- (d) None of the above

**Ans. (c)**

**Q.31** Slip of an induction motor increases with

- (a) Increase in current and decrease in torque
- (b) Increase in current and torque
- (c) Decrease in current and torque
- (d) Decrease in current and increase in torque

**Ans. (b)**

**Q.32** The slip of an induction motor normally does NOT depend on

- (a) Rotor speed
- (b) Synchronous speed
- (c) Shaft torque
- (d) Core-loss component

**Ans. (d)**

**Q.33** A precise phase control for an A.C. load can be controlled by a (an)

- (a) Triac
- (b) SCR
- (c) Transformer
- (d) Trigger pulse

**Ans. (a)**

**Q.34** UJT is known as

- (a) Voltage-controlled device
- (b) Current-controlled device
- (c) Relaxation oscillator
- (d) A transistor

**Ans. (b)**

**Q.35** In a step-up chopper, if  $V_s$  is the source voltage and  $\alpha$  is duty cycle, then the output voltage is

- (a)  $V_s/(1 + \alpha)$
- (b)  $V_s(1 + \alpha)$
- (c)  $V_s(1 - \alpha)$
- (d)  $V_s/(1 - \alpha)$

**Ans. (d)**

**Q.36** A modern power semi-conductor device that combines the characteristics of both BJT and MOSFET

- (a) GTO
- (b) FCT
- (c) IGBT
- (d) MCT

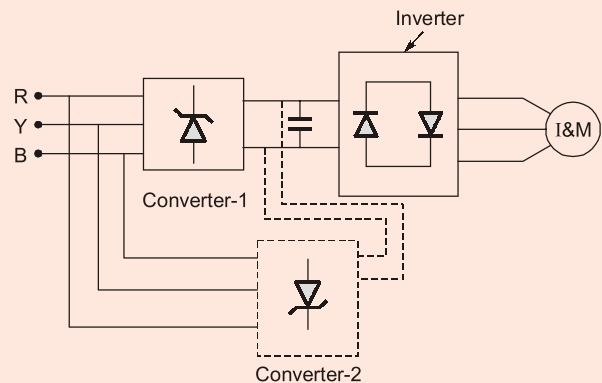
**Ans. (c)**

**Q.37** In a single phase full wave converter (M-2 connection) feeding a highly inductive load, the firing angle for each thyristor is 'a' in the respective half cycle. This period of conduction of each thyristor is

- (a)  $\pi - a$
- (b)  $\pi$
- (c)  $\pi + a$
- (d)  $\pi - 2a$

**Ans. (b)**

**Q.38** In a 3-phase voltage source inverter used for speed control of induction motor anti parallel diodes are used across each switching device as shown in figure. The main purpose of diodes is to



- (a) Protect the switching device against over voltage.
- (b) Provide the path for free wheeling current.
- (c) Allow the motor to return energy during regeneration.
- (d) Help in switching off the devices.

**Ans. (c)**

**Q.39** Consider the following statements related to induction motor drives:

1. Power to weight ratio is high.
2. Suitable for operation at high voltage.
3. Suitable for high speed operation.
4. Power converter is simple and economical.
5. Speed control is easy and of low cost.
6. Reliability is good.

Out of these statements

- (a) 1, 2, 4 and 6 are correct
- (b) 2, 3, 5 and 6 are correct
- (c) 1, 2, 3 and 5 are correct
- (d) 1, 2, 3 and 6 are correct

**Ans. (d)**

**Q.40** In constant V/F speed control of a 3-phase induction motor, if frequency is increased from low value to the rated value, the maximum torque ( $T_{max}$ ) and slip corresponding to the maximum torque ( $S_m$ ) varies as

- (a)  $T_{max}$  increases,  $S_m$  decreases
- (b)  $T_{max}$  increases,  $S_m$  increases
- (c)  $T_{max}$  constant,  $S_m$  decreases
- (d)  $T_{max}$  constant,  $S_m$  increases

**Ans. (c)**

**Q.41** The drive has following equations of motor and load torques in terms of speed

$$T = \frac{2}{\omega} + 2, T_L = \frac{4}{\omega}$$

The equilibrium point is

- (a) Unstable
- (b) Stable
- (c) Marginally stable
- (d) Nothing can be said

**Ans. (a)**

**Q.42** In a non-circulating current mode dual converters, the circulating current is avoided by

- (a) Connecting a series reactor
- (b) Maintaining  $\alpha_1 + \alpha_2 = 180^\circ$
- (c) Operating only one converter
- (d) Adding an extra SCR

**Ans. (a)**

**Q.43** An SCR is made up of silicon because

- (a) Silicon has large leakage current than germanium
- (b) Silicon has small leakage current than germanium
- (c) Silicon has small leakage voltage than germanium
- (d) Silicon has large leakage voltage than germanium

(d) Silicon has large leakage voltage than germanium

**Ans. (b)**

**Q.44** For an application which requires smooth and precise control over the wide range at low cost, the motor preferred is

- (a) Squirrel cage induction motor
- (b) Synchronous motor
- (c) D.C. motor
- (d) Wound rotor induction motor

**Ans. (c)**

**Q.45** In adjustable frequency 3-phase induction motor drives, for constant power application the slip speed is kept

- (a) Constant
- (b) Proportional to synchronous speed
- (c) Inversely proportional to synchronous speed
- (d) Proportional to square of synchronous speed

**Ans. (a)**

**Q.46** The output of logic gate is 1 when all of its input are at logic 0. The gate is either

- (a) a NAND or an EX-OR
- (b) an OR or an EX-NOR
- (c) an AND or an EX-OR
- (d) a NOR or an EX-NOR

**Ans. (d)**

**Q.47** Hamming code is capable of

- (a) Only detects single bit error
- (b) Only corrects single bit error
- (c) Detects and corrects single bit error
- (d) None of the above

**Ans. (c)**

**Q.48** A D-flip-flop can be made from a J-K flip-flop by making

- (a)  $J = K$
- (b)  $J = K = 1$
- (c)  $J = 0, K = 1$
- (d)  $J = \bar{K}$

**Ans. (d)**






# MODULEWISE COURSES for ESE 2021 + GATE 2021

## Comprehensive Online Course for ESE 2021 + GATE 2021

- **GATE + ESE : CE, ME, EE, EC** • **GATE : CS, IN**
- Duration:** 4-5 week for one module.

- Comprehensive online classes by experienced and renowned faculties of MADE EASY.
- Subjects prescribed in module, covers all the topics for GATE & ESE examination.
- The course will also be immensely useful for various State Engineering and PSU Exams.
- Concept practice through workbook questions.
- Provision of books and reading references.
- Doubt clearing facility through chat window.
- Assessment of performance through tests.

Stream	Module 1	Module 2	Module 3	Module 4
CE	SOM + Surveying	SOM + Irrigation	Environmental Enggg + Fluid Mechanics	Reasoning & Aptitude + Engineering Mathematics + General English
ME	Thermo + Industrial	SOM + RAC	Theory of Machines + Fluid Mechanics	
EE	Signals + Digital	Network + Power Electronics	Power System + Control Systems	
EC	EDC + Network	Analog + Digital Circuits	Communication + Control Systems	
CS	OS + Reasoning	DBMS + Mathematics	Algorithm + Computer Organisation	
IN	----	----	Sensors and Industrial Instrumentation + Optical Instrumentation + Process Control Instrumentation (Old Syllabus + New Syllabus) Sensors and Industrial Instrumentation + Optical Instrumentation + Process Control Instrumentation (New Syllabus)	

 8851176822, 9958995830  
 [info@madeeasyprime.com](mailto:info@madeeasyprime.com)  
 [www.madeeasyprime.com](http://www.madeeasyprime.com)

Download  
MADE EASY PRIME app now





**Q.49** The complement of  $[(A \cdot \bar{B} + \bar{C}) \cdot D + \bar{E}] \cdot F$  is

- (a)  $[(A + \bar{B}) \cdot \bar{C} + D \cdot \bar{E}] + F$   
 (b)  $[(\bar{A} + B) \cdot \bar{C} + D + \bar{E}] \cdot F$   
 (c)  $[(\bar{A} + B) \cdot C + \bar{D}] \cdot E + \bar{F}$   
 (d)  $[(A + \bar{B}) \cdot C + \bar{D}] \cdot \bar{E} + F$

**Ans. (c)**

**Q.50** A combination circuit has inputs A, B and C, its K-map is given below. The output of circuit is given by

		AB			
		00	01	11	10
C	0	0	1	0	1
	1	1	0	1	0

- (a)  $(\bar{A}B + A\bar{B})C$       (b)  $(\bar{A}B + A\bar{B})\bar{C}$   
 (c)  $\bar{A}\bar{B}\bar{C}$               (d)  $A \oplus B \oplus C$

**Ans. (d)**

**Q.51** Find out the integrating type analog to digital converter from the following.

- (a) flash type converter  
 (b) tracking converter  
 (c) successive approximation type converter  
 (d) dual-slope analog to digital converter

**Ans. (d)**

**Q.52** The minimum number of 2-input NAND gates required to realize the logic function

$$Y = A\bar{B} + \bar{A}B \text{ is}$$

- (a) 5                      (b) 3  
 (c) 6                      (d) 4

**Ans. (d)**

**Q.53** Find the cut-off frequency for an RC low pass filter of  $R = 8.2 \Omega$  and  $C = 0.0033 \mu\text{F}$ .

- (a) 6 kHz                (b) 5.88 kHz  
 (c) 4.26 kHz            (d) 7.91 kHz

**Ans. (b)**

**Q.54** Why synchronous transmission is preferred more?

- (a) it has no start and stop bit  
 (b) it is cheaper than asynchronous  
 (c) it is easier to implement  
 (d) less complex

**Ans. (b)**

**Q.55** A 400 W carrier is amplitude modulated with  $m = 0.75$ . The total power in AM is

- (a) 400 W                (b) 512 W  
 (c) 588 W                (d) 650 W

**Ans. (b)**

**Q.56** An air filled rectangular waveguide has inner dimensions of 3 cm  $\times$  2 cm. The wave impedance of the TE<sub>20</sub> mode propagation in the waveguide at a frequency of 30 GHz is \_\_\_\_\_. (free space impedance  $\eta_0 = 377 \Omega$ )

- (a) 308  $\Omega$               (b) 355  $\Omega$   
 (c) 400  $\Omega$               (d) 461  $\Omega$

**Ans. (c)**

**Q.57** Noise temperature of Sun is more than \_\_\_\_ K.

- (a) 1000                (b) 5000  
 (c) 100000              (d) 500

**Ans. (c)**

**Q.58** A cavity magnetron uses strapping to

- (a) prevent mode jumping  
 (b) prevent cathode back heating  
 (c) ensure bunching  
 (d) improve the phase focussing effect

**Ans. (a)**

**Q.59** A microwave tube amplifier uses an axial magnetic field and a radial electric field. This is a

- (a) Reflex klystron  
 (b) Co-axial magnetron  
 (c) Travelling wave magnetron  
 (d) CFA

**Ans. (d)**

**Q.60** In a circular waveguide, the dominated mode is

- (a) TE<sub>01</sub>                (b) TE<sub>11</sub>  
 (c) TE<sub>20</sub>                (d) TE<sub>21</sub>

**Ans. (b)**

- Q.61** A hollow rectangular waveguide can NOT propagate TEM wave because
- (a) Of the existence of only one conductor
  - (b) Of the losses caused
  - (c) It is dependent on the type of the material used
  - (d) None of the above

**Ans. (a)**

- Q.62** The most commonly used method for the protection of three phase feeder is
- (a) Time graded protection
  - (b) Differential protection
  - (c) Reverse power protection
  - (d) None of these

**Ans. (b)**

- Q.63** Discrimination between main and backup protection is provided by the use of relays which are
- (a) Fast
  - (b) Sensitive
  - (c) Slow
  - (d) None of these

**Ans. (c)**

- Q.64** Which of the following statements is correct?
- (a) Station batteries are used to operate relay only.
  - (b) The lightning arrestors have surge divertors.
  - (c) An impedance relay has maximum fault current near the relay.
  - (d) A high speed relay has an operation of 1-2 cycles.

**Ans. (b)**

- Q.65** With the use of high speed circuit breakers, which among the following stability is increased?
- (a) Steady-state stability
  - (b) Transient stability
  - (c) Frequency stability
  - (d) All of the above

**Ans. (b)**

- Q.66** The arcing contacts in a circuit breaker is made of
- (a) Copper tungsten alloy
  - (b) Porcelain

- (c) Electrolytic copper
- (d) Aluminium alloy

**Ans. (a)**

- Q.67** A shunt reactor at 100 MVAR is operated at 98% of its rated voltage and at 96% of its rated frequency. The reactive power absorbed by reactor is
- (a) 98 MVAR
  - (b) 104.02 MVAR
  - (c) 96.04 MVAR
  - (d) 100.04 MVAR

**Ans. (d)**

- Q.68** Protective relays can be designed to respond to
- (a) Light intensity, impedance
  - (b) Temperature, resistance, reactance
  - (c) Voltage and current
  - (d) All of these

**Ans. (d)**

- Q.69** Which one of the following methods used for solution of ordinary differential equations is conditionally stable?
- (a) Euler's Method
  - (b) Milne's method
  - (c) Taylor's series method
  - (d) Adams-Bashforth method

**Ans. (a)**

- Q.70** Which one of the following methods used for solving non-linear algebraic equations has rate of convergence 2.0?
- (a) Bisection method
  - (b) Secant method
  - (c) Newton-Raphson method
  - (d) Muller's method

**Ans. (c)**

- Q.71** Which one of the following methods is NOT used for solution of non-linear algebraic equations?
- (a) Regula-Falsi Method
  - (b) Milne's-Predictor-Corrector Method
  - (c) Secant Method
  - (d) Bisection Method

**Ans. (b)**

# ONLINE TEST SERIES



**GATE  
2021**

## Graduate Aptitude Test in Engineering

**Streams:** CE, ME, EE, EC, CS, IN, PI

- On Revised syllabus of GATE 2021.
- Newly introduced MSQs questions added.
- Quality questions as per standard and pattern of GATE.
- Fully explained and well illustrated solutions.
- Due care taken for accuracy.
- Comprehensive performance analysis report.

**54 Tests**  
1782 Questions

Combined Package of GATE 2020 + GATE 2021 also available (108 Tests)

**ESE 2021  
Prelims**

## Engineering Services Examination 2021

### Preliminary Examination

**Streams:** CE, ME, EE, E&T

- Quality questions as per standard and pattern of ESE.
- Includes tests of Paper-I (GS & Engg. Aptitude) and Paper-II (Technical)
- Fully explained and well illustrated solutions.
- Due care taken for accuracy.
- Comprehensive performance analysis report.

**34 Tests**  
2206 Questions

Combined Package of ESE 2020 + ESE 2021 Pre also available (68 Tests)



**Q.72** In a Triclinic crystal, a lattice plane makes intercepts at a length  $a$ ,  $2b$  and  $-\frac{3c}{2}$ . The Miller indices of the plane are

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

**Ans. (c)**

**Q.73** The critical field needed to destroy super conductivity, is known as

- (a)  $H_o(T_c/T)$   
(b)  $H_o(T/T_c)^2$   
(c)  $H_o \left[ 1 - \left( \frac{T_o}{T_c} \right)^2 \right]$   
(d)  $H_o \left[ 1 - \left( \frac{T_c}{T_o} \right)^2 \right]$

**Ans. (c)**

**Q.74** The instruction for starting the computer are housed in

- (a) Random Access Memory  
(b) CD-ROM  
(c) Read Only Memory Chip  
(d) All of the above

**Ans. (c)**

**Q.75** When memory write or I/O read are active, data remains \_\_\_\_\_ of the processor.

- (a) Input            (b) Output  
(c) Processor        (d) None of these

**Ans. (b)**

**Q.76** While performing read operation, one must taken care that much current should NOT be

- (a) Sourced from data lines  
(b) Sunked from data lines  
(c) Sourced or sunked from data lines  
(d) Sunked from address lines

**Ans. (c)**

**Q.77** A three phase induction motor has shaft output of 16 kW. The constant losses are 1 kW. If the

slip be 4%, the rotor copper losses would be

- (a) 600 W            (b) 625 W  
(c) 667 W            (d) 720 W

**Ans. (c)**

**Q.78** In a three stack 12/8 pole variable reluctance motor, rotor pole pitch is

- (a) 15°                (b) 30°  
(c) 45°                (d) 60°

**Ans. (c)**

**Q.79** The condition of a three phase induction motor at no-load resembles those of a transformer whose secondary

- (a) Short circuited  
(b) Open circuited  
(c) Supplying a variable resistive load  
(d) Supplying an inductive load

**Ans. (b)**

**Q.80** The torque angle 'δ' is the angle between

- (a) Rotor field axis and resultant field axis  
(b) Stator field axis and rotor field axis  
(c) Stator field axis and mutual field axis  
(d) Stator field axis and resultant field axis

**Ans. (a)**

**Q.81** In case of the air gap in an induction motor is increased

- (a) The magnetizing current of the rotor will decrease.  
(b) The power factor will decrease.  
(c) The speed of motor will increase.  
(d) The windage losses will increase.

**Ans. (b)**

**Q.82** A stepper motor having a resolution of 300 steps/revolution and running at 2400 rpm has a pulse rate of \_\_\_\_\_ pps.

- (a) 4000                (b) 8000  
(c) 6000                (d) 10000

**Ans. (c)**

**Q.83** A 3-phase, 6-pole, 50 Hz, squirrel cage induction motor is running at a slip of 5%. The speed of stator magnetic field to rotor magnetic field and speed of rotor with respect to stator magnetic field are

- (a) Zero, -50 rpm
- (b) Zero, 955 rpm
- (c) 1000 rpm, -50 rpm
- (d) 1000 rpm, 955 rpm

**Ans. (a)**

**Q.84** In a commutation circuit used to turn-off an SCR, satisfactory turn-off is obtained, when

- (a) Circuit turn-off time < device turn-off time
- (b) Circuit turn-off time > device turn-off time
- (c) Circuit time constant > device turn-off time
- (d) Circuit time constant < device turn-off time

**Ans. (b)**

**Q.85** A TRIAC is a

- (a) 2-terminal switch
- (b) 2-terminal bilateral switch
- (c) 3-terminal unidirectional switch
- (d) 3-terminal bidirectional switch

**Ans. (d)**

**Q.86** Two thyristors of same rating and same specifications

- (a) Will have equal turn-on and turn-off periods
- (b) Will have equal turn-on, but unequal turn-off periods
- (c) May have equal or unequal turn-on and turn-off periods
- (d) Will have unequal turn-on and turn-off periods.

**Ans. (c)**

**Q.87 Assertion (A):** Inverter and choppers use fast switching thyristors.

**Reason (R):** Fast switching SCR has low turn-off time.

- (a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are correct and (R) is not the correct explanation of (A).

- (c) (A) is correct but (R) is wrong.
- (d) (A) is wrong but (R) is correct.

**Ans. (a)**

**Q.88** In a single phase fully controlled bridge rectifier, the output load current  $I$  is ripple free. The r.m.s. value of source current would be

- (a)  $2\sqrt{2}I/\pi$
- (b)  $I$
- (c)  $I/2$
- (d)  $I/4$

**Ans. (b)**

**Q.89** Consider the following statements related to dc drives:

1. Wide speed control range
2. High starting torque
3. High power to weight ratio
4. Fast transient response
5. No limit on highest operating voltage

Out of these statements

- (a) 1, 2 and 3 are correct
- (b) 2, 3 and 4 are correct
- (c) 1, 2 and 4 are correct
- (d) 3, 4 and 5 are correct

**Ans. (c)**

**Q.90** A 20 kW electric motor has heating time constant 60 min. Iron loss is equal to full load copper loss. The short time rating of the motor for 15 minute is

- (a) 43.5 kW
- (b) 56.7 kW
- (c) 60.0 kW
- (d) None of the above

**Ans. (b)**

**Q.91** A 220 V, 20 A, 1000 rpm, separately excited d.c. motor has armature resistance of 1 ohm. The motor is supplied from 250 V dc supply via a step down chopper for operation of motor at 500 rpm at the rated torque, the duty ratio of the chopper should be

- (a) 0.40
- (b) 0.44
- (c) 0.48
- (d) 0.50

**Ans. (c)**



**MADE EASY**

India's Best Institute for IES, GATE & PSUs

Exclusive Package

**12**

**Full Syllabus Tests**

**GATE 2021  
Online Test Series**

Stream: CE, ME, EE, EC, CS, IN, PI

**Rs. 500/-** +GST

- ✓ As per revised pattern and syllabus of GATE 2021.
- ✓ Fully explained and well illustrated solutions.
- ✓ Facility of asking your doubt with experts.

**Click to enroll**



[www.onlinetestseriesmadeeasy.in](http://www.onlinetestseriesmadeeasy.in)

**Q.92** The consideration involved in the selection of the type of electric drive for a specific application depends upon

- (a) Speed control range and its nature
- (b) Starting nature
- (c) Environmental condition
- (d) All the above

**Ans. (d)**

**Q.93** A single phase half-wave rectifier circuit has free-wheeling diode, the free-wheeling diode will conduct only if

- (a) load is purely resistive
- (b) load is purely inductive
- (c) load is combination of  $R$  and  $L$
- (d) load is purely inductive or combination of  $R$  and  $L$

**Ans. (d)**

**Q.94** Find the expression for peak capacitor voltage in case of current commuted chopper circuit.

- (a)  $I_o \sqrt{\frac{L}{C}}$
- (b)  $V_s + \sqrt{\frac{L}{C}}$
- (c)  $V_s + I_o \sqrt{\frac{L}{C}}$
- (d) 0 (Zero)

**Ans. (c)**

**Q.95** Which one of the following is NOT inherently constant torque motor?

- (a) DC series motor
- (b) DC shunt motor
- (c) Three phase induction motor
- (d) Single phase induction motor

**Ans. (a)**

**Q.96** A 4-bit R/2R digital to analog converter (DAC) has a reference of 5 Volts. What is the analog output for input code 0101?

- (a) 0.3125 V
- (b) 3.125 V
- (c) 0.78125 V
- (d) -3.125 V

**Ans. (b)**

**Q.97** Which of the following equations satisfy the J-K flip-flop?

$$(a) Q_{n+1} = J_n \bar{Q}_n + \bar{K}_n Q_n$$

$$(b) Q_{n+1} = \bar{J}_n \bar{Q}_n + K_n Q_n$$

$$(c) Q_{n+1} = J_n Q_n + K_n Q_n$$

$$(d) Q_{n+1} = \bar{J}_n \bar{Q}_n + \bar{K}_n \bar{Q}_n$$

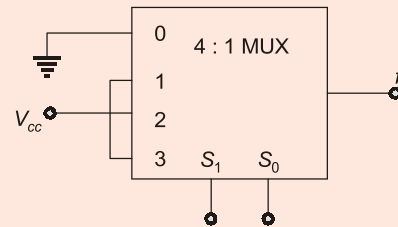
**Ans. (a)**

**Q.98** POS form of Boolean expression is suitable for circuit implementation, using

- (a) XOR
- (b) NAND
- (c) AND
- (d) NOR

**Ans. (d)**

**Q.99** The output  $f$  of the 4 : 1 MUX shown in figure is



- (a)  $\bar{x}y + x$
- (b)  $x + y$
- (c)  $\bar{x} + \bar{y}$
- (d)  $xy + \bar{x}$

**Ans. (b)**

**Q.100** The Boolean function  $A + BC$  is a reduced form of

- (a)  $AB + BC$
- (b)  $(A + B)(A + C)$
- (c)  $A'B + AB'C$
- (d)  $(A + C)B$

**Ans. (b)**

**Q.101** A 10-bit D/A converter gives a maximum output of 10.23 V. The resolution is

- (a) 10 mV
- (b) 20 mV
- (c) 15 mV
- (d) 25 mV

**Ans. (a)**

**Q.102** Which of the following expressions does NOT represent exclusive NOR of  $x$  and  $y$ ?

- (a)  $xy + \bar{x}\bar{y}$
- (b)  $x \oplus \bar{y}$
- (c)  $\bar{x} \oplus y$
- (d)  $\bar{x} \oplus \bar{y}$

**Ans. (d)**

- Q.103** A ripple counters speed is limited by the propagation delay of
- each flip-flop
  - all flip-flop and gates
  - flip-flops only with gates
  - only circuit gates

**Ans. (a)**

- Q.104** When aliasing take place
- Sampling signals less than Nyquist rate
  - Sampling signals more than Nyquist rate
  - Sampling signals equal to Nyquist rate
  - Sampling signals at a rate which is twice of Nyquist rate

**Ans. (a)**

- Q.105** Consider sinusoidal modulation in an AM system. Assuming no over modulation the modulation index ( $\mu$ ) when the maximum and minimum values of the envelope, respectively are 3V and 1V is
- 0.7
  - 0.5
  - 0.3
  - 0.8

**Ans. (b)**

- Q.106** The  $Q$ -factor of a waveguide resonator is given by ( $\omega_0$  is resonant frequency,  $U$  is energy storage and  $\omega_L$  is power loss)

$$(a) Q = \frac{\omega_0 U}{\omega_L} \quad (b) Q = \frac{\omega_0 \omega_L}{U}$$

$$(c) Q = \omega_0 U \omega_L \quad (d) Q = \frac{U \omega_L}{\omega_0}$$

**Ans. (a)**

- Q.107** A speech signal is sampled at 8 kHz and encoded in PCM format using 8-bit/sample PCM data is transmitted through a baseband channel via 4-level PAM. Minimum Bandwidth required for transmission is
- 16 kHz
  - 8 kHz
  - 24 kHz
  - 10 kHz

**Ans. (a)**

- Q.108** For best low level noise performance in the X-band, an amplifier should use
- A bipolar transistor
  - A gunn diode
  - A step-recovery diode
  - An IMPATT diode

**Ans. (c)**

- Q.109** A lossless line of characteristic impedance  $z_0$  is terminated in pure reactance of  $-jz_0$ . Voltage Standing Wave Ratio (VSWR) is
- 10
  - 2
  - 1
  - infinity

**Ans. (d)**

- Q.110** In colour TV receiver, varactor diode is used for
- Deflection
  - Rectification
  - Tuning
  - Both (a) and (b)

**Ans. (c)**

- Q.111** FDM is an analog multiplexing technique used to combine
- Analog signals
  - Digital signals
  - Both analog and digital signals
  - Alternatively passes analog and digital signal

**Ans. (a)**

- Q.112** Large internal faults in transformer are protected by
- Merz-price percentage differential protection
  - Mho and ohm relays
  - Horn gaps and temperature relays
  - Earth fault and positive sequence relays

**Ans. (a)**

- Q.113** If the fault current is 2000 A, the relay setting is 50% and CT ratio is 400 : 5, the PSM will be
- 25
  - 15
  - 50
  - 10

**Ans. (d)**



- Q.114** An ideal circuit breaker should offer
- Zero and infinite impedances before and after arc interruption respectively.
  - Infinity and zero impedances before and after arc interruption respectively
  - Equal impedance before and after arc interruption
  - None of these

**Ans. (a)**

- Q.115** A three-phase, 33 kV, oil circuit breaker is rated 1200 A, 2000 MVA, 3 sec. The symmetrical breaking current will be
- 1200 A
  - 3600 A
  - 35 kA
  - 104.8 kA

**Ans. (c)**

- Q.116** With the help of reactive compensator, it is possible to have
- Constant voltage operation only
  - Unity p.f. operation only
  - Both constant voltage and unit p.f.
  - Either constant voltage operation or unity p.f. operation.

**Ans. (d)**

- Q.117** The most efficient torque producing actuating structure for the induction type relays
- Shaded pole structure
  - Watt hour meter structure
  - Induction cup structure
  - Single induction loop structure

**Ans. (a)**

- Q.118** Why are the ternary lead cables used near the railway track?
- Because they have high tensile strength.
  - Have a low coefficient of thermal expansion.
  - Have low specific gravity.
  - Can withstand shocks and vibrations.

**Ans. (c)**

- Q.119** Given that  $\frac{dy}{dx} = x^2 + y$ , with  $y(0) = 1$ , when  $x = 0$ , taking  $h = 0.2$  The value of  $y$  after 1 iteration using Euler's modified method is

- 1.2
- 1.224
- 1.228
- 1.232

**Ans. (b)**

- Q.120** The points where Newton-Raphson method fails are called
- Floating
  - Continuous
  - Non-stationary
  - Stationary

**Ans. (d)**

- Q.121** Newton-Raphson method is used to compute a root of the equation  $x^2 - 13 = 0$  with 3.5 as initial value. The approximation after one iteration is
- 3.575
  - 3.676
  - 3.667
  - 3.607

**Ans. (d)**

- Q.122** Which one of the following materials is a diamagnetic material?
- Copper
  - Nickel
  - Iron
  - Aluminium

**Ans. (a)**

- Q.123** The structure sensitive property of a super conductor is
- Critical magnetic field
  - Transition temperature
  - Critical current density
  - None of the above

**Ans. (c)**

- Q.124** The 2's complement representation of decimal number  $[-17]$  is
- [100110]
  - [101111]
  - [111110]
  - [110001]

**Ans. (b)**

- Q.125** The smallest integer that can be represented by an 8-bit number of 2's complement form is
- 256
  - 128
  - 127
  - 0

**Ans. (b)**

