# SEE / 2022

# Electrical Engineering

Series : **A**

Question Booklet No. प्रश्न पुस्तिका क्रम संख्या **100137**

अनुक्रमांक
**Roll No.** | | | | | | | ← परीक्षार्थी अपना अनुक्रमांक दिए गए खानों में लिखें
Candidate should write his/her Roll No. in the given boxes

मुद्रित पृष्ठों की संख्या/No. of Printed Pages : **32**
समय/Time : **3 घण्टे/Hours**

कुल प्रश्नों की संख्या/Total No. of Questions : **150**
पूर्णांक/Total Marks : **450**

## परीक्षार्थियों के लिए निर्देश

1. परीक्षा प्रारम्भ होने के तुरन्त बाद, आप इस प्रश्न-पुस्तिका की पड़ताल अवश्य कर लें, कि इसमें कोई बिना छपा, फटा या छूटा हुआ पृष्ठ अथवा प्रश्नांश आदि न हो। यदि ऐसा है, तो वीक्षक से तत्काल संपर्क कर प्रश्न-पुस्तिका बदल लेवें।
2. यह प्रश्न-पुस्तिका सम्मिलित रूप से दो खण्डों में विभाजित हैं, खण्ड – 'अ' तथा खण्ड – 'ब'।
3. खण्ड – 'अ' सामान्य अध्ययन से संबंधित है, जिसमें कुल **50** प्रश्न हैं। ये प्रश्न हिन्दी तथा अंग्रेज़ी भाषा में हैं। **सभी** प्रश्न अनिवार्य हैं।
4. खण्ड – 'ब' संबंधित **इलेक्ट्रिकल इंजीनियरिंग** के विषय से है, जिसमें कुल **100** प्रश्न हैं। सभी प्रश्न अंग्रेज़ी भाषा में हैं। **सभी** प्रश्न अनिवार्य हैं।
5. **सभी** प्रश्नों के अंक समान हैं। प्रत्येक **सही** उत्तर के लिए **03** अंक प्रदान किए जाएँगे। **ऋणात्मक मूल्यांकन** का प्रावधान है। प्रत्येक गलत उत्तर के लिए **01** अंक काटा जाएगा।
6. प्रदत्त उत्तर-पत्र (ओ०एम०आर० शीट) पर दिए गए निर्देशों को ध्यानपूर्वक पढ़ें तथा अपने उत्तर तदनुसार अंकित करें।
7. कृपया उत्तर-पत्र (ओ०एम०आर० शीट) पर निर्धारित स्थानों पर आवश्यक प्रविष्टियाँ करें, अन्य स्थानों पर नहीं।
8. परीक्षार्थी सभी रफ़ कार्य प्रश्न-पुस्तिका के अंतिम पृष्ठों पर निर्धारित स्थान पर ही करें, अन्यत्र कहीं नहीं तथा उत्तर-पत्र (ओ०एम०आर० शीट) पर भी नहीं।
9. यदि खण्ड – 'अ' के किसी प्रश्न में किसी प्रकार की कोई मुद्रण या तथ्यात्मक प्रकार की त्रुटि हो, तो प्रश्न के हिन्दी तथा अंग्रेज़ी रूपांतरों में से हिन्दी रूपांतर को मानक माना जाएगा।

## INSTRUCTIONS TO THE CANDIDATES

1. Immediately after the commencement of the examination, you should check that this Question Booklet ***does not*** have any unprinted or torn or missing pages or question part etc. If so, immediately contact the Invigilator and get it replaced with another Question Booklet.
2. This combined Question Booklet is divided in two Sections, Section—'A' and Section—'B'.
3. Section—'A' contains **50** questions related to General Studies. These questions are in Hindi and English languages. **All** questions are compulsory.
4. Section—'B' contains **100** questions of concerned **Electrical Engineering** subject. All questions are in English language. **All** questions are compulsory.
5. **All** questions carry equal marks. **03** marks will be given for each ***correct*** answer. There is a provision of **Negative Marking**. For each wrong answer, **01** mark will be deducted.
6. Read carefully the instructions given on the Answer Sheet (OMR Sheet) supplied and indicate your answers accordingly.
7. Kindly make necessary entries on the Answer Sheet (OMR Sheet) at the places indicated and nowhere else.
8. Examinee should do all rough works on the space meant for rough work on pages given at the end of the Question Booklet and nowhere else, not even on the Answer Sheet (OMR Sheet).
9. If there is any sort of mistake either of printing or of factual nature in any question of Section—'A', then out of the Hindi and English versions of the question, the Hindi version will be treated as standard.

SEAL

## खण्ड – अ
## सामान्य अध्ययन

**1.** मित्र से तुरंत रीयल टाईम संचार के लिए किसका उपयोग करना चाहिए?

[A] ई-मेल (E-mail)

[B] आई०आर०सी० (IRC)

[C] यूजनेट (Usenet)

[D] इंस्टेट मैसेजिगं (Instant messaging)

**2.** निम्न में से कौन, एक ई-कॉमर्स ऐक्टिविटी नहीं है?

[A] बी टू बी (B2B)

[B] सी टू बी (C2B)

[C] बी टू ए (B2A)

[D] उपर्युक्त में से कोई नहीं

**3.** ट्यूरिंग टेस्ट में सहभागियों की संख्या _____ होती है।

[A] एक

[B] तीन

[C] चार

[D] उपर्युक्त में से कोई नहीं

**4.** फजी लॉजिक का _____ में बहुत सफल उपयोग हो रहा है।

[A] वाशिंग मशीन

[B] एयर कंडीशनर

[C] डिसवाशर

[D] उपर्युक्त सभी

**5.** निम्न में से किस प्रतीक एवं नियम का उपयोग FOPL में होता है?

[A] प्रेडीकेट

[B] लॉजिक क्वान्टिफायर्स

[C] [A] एवं [B] दोनों

[D] उपर्युक्त में से कोई नहीं

**6.** निम्नलिखित विकल्पों में से संचार में उपयोगी गाइडेड मीडिया का उदाहरण कौन-सा है?

[A] USB-तरंग

[B] रेडियो तरंग

[C] इन्फ्रारेड

[D] फाइबर ऑप्टिक केबल

**7.** भारत सरकार के द्वारा NMEICT परियोजना किस विभाग के लिए प्रारंभ किया गया है?

[A] प्रशासनिक विभाग

[B] वित्त विभाग

[C] शिक्षण विभाग

[D] संरक्षण विभाग

**8.** निम्न में से कौन-सा बस, कम्प्यूटर उपयोगकर्ता को 'प्लग एण्ड प्ले' ऑपरेशन का साधन देता है?

[A] PCI

[B] SCSI

[C] USB

[D] INT

**9.** आर्टिफिशियल इन्टेलीजेन्स में कम्प्यूटर, मानव के समकक्ष सोचने के लिए काबिल है या नहीं, ये जानने के लिए कौन-सी पद्धति उपयोग होती है?

[A] Alpha Test

[B] A* Algorithm

[C] Turing Test

[D] Beta Test

**10.** एनालॉग सिग्नल को डिजिटल सिग्नल में रूपांतरित करने की प्रक्रिया का नाम है

[A] क्वांइटाइजेशन

[B] पल्स कोड मॉड्युलेशन

[C] B8ZS

[D] HDB3

## SECTION—A

## General Studies

1. What would you use for immediate real time communication with a friend?
   [A] E-mail
   [B] IRC
   [C] Usenet
   [D] Instant messaging

2. Which of the following is ***not*** an E-commerce activity?
   [A] B2B
   [B] C2B
   [C] B2A
   [D] None of the above

3. In Turing test, the number of participants is
   [A] one
   [B] three
   [C] four
   [D] None of the above

4. Fuzzy logic has been very successful in _____ application.
   [A] washing machine
   [B] air conditioner
   [C] dishwasher
   [D] All of the above

5. Which of the following symbols and rules are used in FOPL?
   [A] Predicate
   [B] Logic Quantifiers
   [C] Both [A] and [B]
   [D] None of the above

6. Which of the following is an example of guided media in communication?
   [A] USB-waves
   [B] Radio waves
   [C] Infrared
   [D] Fibre optic cable

7. Government of India has launched NMEICT project for which sector?
   [A] Administration sector
   [B] Finance sector
   [C] Education sector
   [D] Conservation sector

8. Which of the following bus provides 'Plug and play' mode of operation to computer user?
   [A] PCI
   [B] SCSI
   [C] USB
   [D] INT

9. The method used in Artificial Intelligence, for determining whether a computer is capable of thinking like a human being or ***not***, is called
   [A] Alpha Test
   [B] A* Algorithm
   [C] Turing Test
   [D] Beta Test

10. Which technique is used to convert an analog signal to digital signal?
    [A] Quantization
    [B] Pulse Code Modulation
    [C] B8ZS
    [D] HDB3

11. निम्न में से किस अभिलेख में तन्तुवाय श्रेणी का विवरण मिलता है?

[A] समुद्रगुप्त की प्रयाग प्रशस्ति

[B] चन्द्रगुप्त द्वितीय का सांची अभिलेख

[C] कुमारगुप्त का मन्दसौर अभिलेख

[D] स्कंदगुप्त का भितरी अभिलेख

12. प्राचीन नाम मैकल से निम्न में से किस क्षेत्र का बोध होता है?

[A] अमरकंटक

[B] उज्जैन

[C] मालवा

[D] बुन्देलखंड

13. किस चंदेल शासक ने प्रयाग के संगम में जलसमाधि ली थी?

[A] हर्ष

[B] यशोवर्मन

[C] धंग

[D] विद्याधर

14. धार में शारदा सदन की स्थापना किसने करवाई थी?

[A] राजा भोज

[B] विद्याधर

[C] वाक्पति मुंज

[D] सिन्धुराज

15. उस यूनानी राजदूत का नाम बताइये, जिसने बेसनगर में गरुड़ स्तम्भ की प्रतिष्ठा की।

[A] मेगस्थनीज

[B] हेलियोडोरस

[C] एरियन

[D] मिनाण्डर

16. 'विद्धशालभंजिका' के लेखक कौन थे?

[A] बिल्हण

[B] सोमदेव

[C] भास

[D] राजशेखर

17. 'राम रसायन' के लेखक कौन हैं?

[A] पद्माकर

[B] ईसुरी

[C] राजशेखर

[D] बिल्हण

18. बघेली को उत्तर प्रदेश के किस बोली के निकट माना जाता है?

[A] भोजपुरी

[B] अवधी

[C] खड़ी हिन्दी

[D] ब्रज

19. बुन्देलखंड में लोक देवता के रूप में मान्य हैं

[A] पाबूजी राठौड़

[B] लाला हरदौल

[C] वीर लोरिक

[D] गोगाजी

11. Which of the following inscriptions gives an account of a guild of weavers?

[A] Prayag Prashasti of Samudragupta

[B] Sanchi inscription of Chandragupta II

[C] Mandsaur inscription of Kumaragupta

[D] Bhitari inscription of Skandagupta

12. Ancient name Maikal denotes which of the following areas?

[A] Amarkantak

[B] Ujjain

[C] Malwa

[D] Bundelkhand

13. Which Chandela king died by abandoning his body at the confluence of Prayag?

[A] Harsha

[B] Yashovarman

[C] Dhanga

[D] Vidyadhara

14. Who established Sarada Sadan in Dhar?

[A] King Bhoja

[B] Vidyadhara

[C] Vakpati Munja

[D] Sindhuraja

15. Name the Greek ambassador who established the Garuda Pillar at Besnagar.

[A] Megasthenes

[B] Heliodorus

[C] Arrian

[D] Menander

16. Who was the author of *Viddhasalabhanjika*?

[A] Bilhana

[B] Somadeva

[C] Bhasa

[D] Rajashekhara

17. Who is the author of *Ram Rasayan*?

[A] Padmakar

[B] Ishuri

[C] Rajashekhara

[D] Bilhana

18. Bagheli is closer to which dialect of Uttar Pradesh?

[A] Bhojpuri

[B] Avadhi

[C] Khadi Hindi

[D] Braj

19. Who is accredited as the folk deity at Bundelkhand?

[A] Pabuji Rathore

[B] Lala Hardaul

[C] Veer Lorik

[D] Gogaji

**20.** खजुराहो मन्दिर समूह के निर्माता कौन थे?

[A] पाल

[B] प्रतिहार

[C] चन्देल

[D] परमार

**21.** निम्नलिखित में से मध्य प्रदेश के किस क्षेत्र में सघनतम वन पाये जाते हैं?

[A] दुदवारा – नरसिंहपुर – हवेली

[B] गिर्द – ग्वालियर

[C] सतपुड़ा – मैकल क्षेत्र

[D] उपर्युक्त में से कोई नहीं

**22.** निम्नलिखित में से कौन-से कथन, मालवा के पठार की **सही** अवस्थिति दर्शाते हैं?

*(a)* यह मध्य-अधित्यका के पश्चिमी भाग में स्थित है।

*(b)* यह बेतवा एवं जोहिला की घाटी में स्थित है।

*(c)* यह बुन्देलखंड अधित्यका के पूर्व में स्थित है।

*(d)* यह नर्मदा नदी के उत्तर में स्थित है।

[A] *(a)* एवं *(d)*

[B] *(a)* एवं *(c)*

[C] *(b)* एवं *(d)*

[D] *(c)* एवं *(b)*

**23.** निम्नलिखित कथनों में से कौन-सा कथन मध्य प्रदेश की जलवायु के संदर्भ में **असत्य** है?

[A] सर्दियों में औसत न्यूनतम तापमान 10 °C एवं औसत अधिकतम तापमान 25 °C होता है

[B] औसत वार्षिक वर्षा 200 mm से कम होती है

[C] दक्षिण-पूर्वी क्षेत्र में सर्वाधिक वर्षा एवं उत्तर-पश्चिम में उत्तरोत्तर कम वर्षा होती है

[D] उपर्युक्त में से कोई नहीं

**24.** जोहिला, सोहागपुर, पेंच, कन्हान एवं सिंगरौली क्षेत्रों में कौन-सा ऊर्जा संसाधन सर्वाधिक पाया जाता है?

[A] लौह अयस्क

[B] खनिज तेल

[C] प्राकृतिक गैस

[D] कोयला

**25.** मैंगनीज अयस्क की प्रमुख पेटी किन जिला क्षेत्रों में पायी जाती है?

[A] श्योपुर, मुरैना, शिवपुरी

[B] बालाघाट, छिंदवाड़ा, झाबुआ

[C] सीधी, कटनी, मंदसौर

[D] ग्वालियर, खण्डवा, भोपाल

**20.** Who was the builder of the Khajuraho group of temple?

[A] Pala

[B] Pratihara

[C] Chandela

[D] Paramara

**21.** Which of the following regions of Madhya Pradesh are densely forested?

[A] Dudwara – Narsinghpur – Haveli

[B] Gird – Gwalior

[C] Satpura – Maikal area

[D] None of the above

**22.** Which of the following statements represents the ***correct*** location of the Malwa Plateau?

*(a)* It lies on the western part of central highland.

*(b)* It lies between Betwa and Johilla valley.

*(c)* It lies to the east of Bundelkhand highland.

*(d)* It lies to the north of river Narmada.

[A] *(a)* and *(d)*

[B] *(a)* and *(c)*

[C] *(b)* and *(d)*

[D] *(c)* and *(b)*

**23.** Which of the following statements is ***incorrect*** regarding the climate of Madhya Pradesh?

[A] In winter, the mean minimum temperature is 10 °C and the mean maximum temperature is 25 °C

[B] Average rainfall is less than 200 mm

[C] The heaviest rainfall is in the south-eastern part and gradually decreases in north-west

[D] None of the above

**24.** Which of the following energy resources is found abundantly in Johila, Sohagpur, Pench, Kanhan and Singrauli?

[A] Iron ore

[B] Mineral oil

[C] Natural gas

[D] Coal

**25.** The most important manganese producing belt lies in which of the following district regions?

[A] Sheopur, Morena, Shivpuri

[B] Balaghat, Chhindwara, Jhabua

[C] Sidhi, Katni, Mandsaur

[D] Gwalior, Khandwa, Bhopal

**26.** निम्नलिखित कथनों का अध्ययन करें।

*(a)* यह मध्य प्रदेश और उत्तर प्रदेश की बहुउद्देशीय परियोजना है।

*(b)* इस परियोजना के अंतर्गत बेतवा नदी पर अशोक नगर एवं ललितपुर की सीमा पर बांध बनाया गया है।

*(c)* इस बांध की ऊँचाई 43·80 मीटर एवं लम्बाई 562·50 मीटर है।

निम्न में से कौन-सी सिंचाई परियोजना, ऊपर के कथनों को दर्शाती है?

[A] हरसी

[B] राजघाट

[C] गांधीसागर

[D] बाणसागर

**27.** छतरपुर जिले में पाया जाने वाला हीरा, निम्नलिखित में से किस विकास खण्ड में अवस्थित है?

[A] बंदर

[B] पिछोर

[C] पिपरिया

[D] उपर्युक्त में से कोई नहीं

**28.** मध्य प्रदेश सरकार द्वारा किस वर्ष नवीन एवं नवीकरणीय ऊर्जा विभाग का अलग से गठन किया गया?

[A] अप्रैल, 2008

[B] अप्रैल, 2009

[C] अप्रैल, 2010

[D] अप्रैल, 2011

**29.** मध्य प्रदेश में सिंचाई का प्रमुख संसाधन क्या है?

[A] नदी

[B] नहर

[C] कुँआ एवं ट्यूबवेल

[D] तालाब

**30.** पचमढ़ी में तापमान कम रहने का प्रमुख कारण क्या है?

[A] ऊँचाई एवं वनस्पति

[B] कम जनसंख्या एवं वर्षा

[C] वनस्पति एवं नदियाँ

[D] नदियाँ एवं झरने

**31.** निम्नलिखित में से कौन, मध्य प्रदेश के राज्यपाल **नहीं** थे?

[A] लालजी टंडन

[B] कुंवर महमूद अली खाँ

[C] कैलाश नाथ काटजू

[D] सरला ग्रेवाल

**32.** निम्नलिखित में से कौन मध्य प्रदेश के मुख्यमंत्री थे?

[A] सत्यनारायण सिंह

[B] रामनरेश यादव

[C] भगवत दयाल शर्मा

[D] सुन्दरलाल पटवा

**33.** मध्य प्रदेश में पंचायती राज व्यवस्था है

[A] एक स्तरीय

[B] द्वि स्तरीय

[C] तीन स्तरीय

[D] उपर्युक्त में से कोई नहीं

**26.** Study the following statements.

*(a)* It is a multipurpose project of Madhya Pradesh and Uttar Pradesh.

*(b)* The dam is constructed on Betwa river on the boundary of Ashoknagar and Lalitpur.

*(c)* The height of the dam is 43·80 meters and length is 562·50 meters.

Which of the following irrigation projects represents the above statements?

[A] Harsi

[B] Rajghat

[C] Gandhi Sagar

[D] Bansagar

**27.** Diamond, which is found in Chhatarpur district is located in which of the following development blocks?

[A] Bunder

[B] Picchore

[C] Pipariya

[D] None of the above

**28.** In which year did the Madhya Pradesh Government constitute a separate department of new and renewable energy?

[A] April, 2008

[B] April, 2009

[C] April, 2010

[D] April, 2011

**29.** What is the major source of irrigation in Madhya Pradesh?

[A] River

[B] Canal

[C] Well and Tubewell

[D] Pond

**30.** What is the main cause of low temperature in Pachmarhi?

[A] Height and vegetation

[B] Low population and rain

[C] Vegetation and rivers

[D] Rivers and waterfalls

**31.** Who among the following was ***not*** the Governor of Madhya Pradesh?

[A] Lalji Tandon

[B] Kunwar Mahmood Ali Khan

[C] Kailash Nath Katju

[D] Sarla Grewal

**32.** Who among the following was the Chief Minister of Madhya Pradesh?

[A] Satyanarayan Singh

[B] Ram Naresh Yadav

[C] Bhagwat Dayal Sharma

[D] Sunder Lal Patwa

**33.** The Panchayati Raj system in Madhya Pradesh is

[A] one tier

[B] two tier

[C] three tier

[D] None of the above

34. भगोरिया पर्व मध्य प्रदेश के किस जिले में मनाया जाता है?

[A] झाबुआ

[B] भोपाल

[C] देवास

[D] उज्जैन

35. 2011 की जनगणना के अनुसार, मध्य प्रदेश का सबसे कम जनसंख्या घनत्व वाला जिला कौन-सा है?

[A] डिन्डौरी

[B] हरदा

[C] मंडला

[D] अलीराजपुर

36. 2011 की जनगणना के अनुसार, मध्य प्रदेश का न्यूनतम जनसंख्या वाला जिला कौन-सा है?

[A] डिन्डौरी

[B] हरदा

[C] जबलपुर

[D] देवास

37. संत शिरोमणि रविदास ग्लोबल स्किल्स पार्क मध्य प्रदेश में कहाँ अवस्थित है?

[A] भोपाल

[B] शाजापुर

[C] छिंदवाड़ा

[D] नरसिंहपुर

38. आयुध निर्माणी खमरिया, मध्य प्रदेश के किस जिले में अवस्थित है?

[A] इन्दौर

[B] भोपाल

[C] जबलपुर

[D] सागर

39. मध्य प्रदेश सरकार द्वारा शुरू किया गया 'सौदा-पत्रक मोबाइल एप' किससे संबंधित है?

[A] कृषि क्षेत्र से

[B] औद्योगिक क्षेत्र से

[C] शिक्षा क्षेत्र से

[D] उपर्युक्त में से कोई नहीं

40. 'एक जिला एक उत्पाद' (ODOP) के तहत मध्य प्रदेश में इन्दौर जिले का उत्पाद है

[A] बाँस

[B] प्याज

[C] लहसुन

[D] आलू

41. निम्नलिखित में से कौन, वर्ष 2023 में भारतीय गणतंत्र दिवस के अवसर पर मुख्य अतिथि के रूप में सम्मिलित हुए?

[A] अब्देल फतेह अल-सिसी

[B] जस्टिन ट्रूडो

[C] जो बाइडेन

[D] ऋषि सुनक

34. In which district of Madhya Pradesh is Bhagoria festival celebrated?

[A] Jhabua

[B] Bhopal

[C] Dewas

[D] Ujjain

35. According to 2011 census, which is the district with the lowest population density in Madhya Pradesh?

[A] Dindori

[B] Harda

[C] Mandla

[D] Alirajpur

36. According to 2011 census, which is the least populous district of Madhya Pradesh?

[A] Dindori

[B] Harda

[C] Jabalpur

[D] Dewas

37. Where is Sant Shiromani Ravidas Global Skills Park located in Madhya Pradesh?

[A] Bhopal

[B] Shajapur

[C] Chhindwara

[D] Narsinghpur

38. In which district of Madhya Pradesh is Ordnance Factory, Khamaria situated?

[A] Indore

[B] Bhopal

[C] Jabalpur

[D] Sagar

39. 'Souda-Patrak Mobile App' launched by Government of Madhya Pradesh, is related to which of the following?

[A] Agricultural sector

[B] Industrial sector

[C] Educational sector

[D] None of the above

40. The product of Indore district in Madhya Pradesh under 'One District One Product' (ODOP) is

[A] bamboo

[B] onion

[C] garlic

[D] potato

41. Who among the following attended the Republic Day of India as the chief guest in the year 2023?

[A] Abdel Fattah el-Sisi

[B] Justin Trudeau

[C] Joe Biden

[D] Rishi Sunak

**42.** पी-75 परियोजना के तहत निर्मित कलवरी श्रेणी की किस पनडुब्बी को जनवरी, 2023 में भारतीय नौसेना में सम्मिलित किया गया?

[A] आई०एन०एस० कलवरी

[B] आई०एन०एस० दामिनी

[C] आई०एन०एस० खंडेरी

[D] आई०एन०एस० वागीर

**43.** 36वें राष्ट्रीय खेलों का आयोजन किस राज्य में सम्पन्न हुआ?

[A] गुजरात में

[B] उत्तर प्रदेश में

[C] झारखण्ड में

[D] केरल में

**44.** फरवरी, 2023 में 'राष्ट्रीय संस्कृति महोत्सव 2023' का आयोजन कहाँ किया गया?

[A] भोपाल में

[B] भुवनेश्वर में

[C] बेंगलुरु में

[D] मुम्बई में

**45.** देश का पहला जियोलॉजिकल पार्क, मध्य प्रदेश में कहाँ स्थापित किया जा रहा है?

[A] लम्हेटा गाँव

[B] तामोट

[C] नागौद

[D] हथनोरा

**46.** 17वाँ प्रवासी भारतीय दिवस कहाँ आयोजित किया गया था?

[A] इन्दौर में

[B] भोपाल में

[C] मुम्बई में

[D] लखनऊ में

**47.** निम्न में से कौन-सा, मध्य प्रदेश का UNESCO विश्व विरासत स्थल नहीं है?

[A] खजुराहो स्मारकों का समूह

[B] भीमबेटका के रॉक शेल्टर

[C] सांची के बौद्ध स्मारक

[D] विदिशा की उदयगिरि गुफाएँ

**48.** निम्नलिखित में से किस खेल को मध्य प्रदेश के राज्य खेल के रूप में घोषित किया गया है?

[A] टेबल टेनिस

[B] फुटबॉल

[C] मलखम्ब

[D] बैडमिंटन

**49.** निम्न में से बालिकाओं के स्वास्थ्य एवं शिक्षा की स्थिति में सुधार के लिए, मध्य प्रदेश सरकार की योजना कौन-सी है?

[A] बेटी बचाओ बेटी पढ़ाओ अभियान

[B] लाडली लक्ष्मी योजना

[C] गाँव की बेटी योजना

[D] बालिका शिक्षा एवं स्वास्थ्य प्रोत्साहन योजना

**50.** मध्य प्रदेश सरकार की खेत-तालाब योजना के अन्तर्गत किसानों को मिलने वाले अनुदान की अधिकतम सीमा क्या है?

[A] ₹32,000

[B] ₹21,350

[C] ₹16,350

[D] उपर्युक्त में से कोई नहीं

42. Which Kalvari class submarine, built under the P-75 project, was inducted into the Indian Navy in January, 2023?

[A] INS Kalvari

[B] INS Damini

[C] INS Khanderi

[D] INS Vagir

43. In which State was the 36th National Games organised?

[A] Gujarat

[B] Uttar Pradesh

[C] Jharkhand

[D] Kerala

44. In February 2023, 'Rashtriya Sanskriti Mahotsav 2023' was-organized in

[A] Bhopal

[B] Bhubaneswar

[C] Bengaluru

[D] Mumbai

45. Where in Madhya Pradesh, is the country's first Geological Park being set up?

[A] Lamheta Village

[B] Tamot

[C] Nagaud

[D] Hathnora

46. Where was the 17th Pravasi Bharatiya Divas organized?

[A] Indore

[B] Bhopal

[C] Mumbai

[D] Lucknow

47. Which of the following is ***not*** a UNESCO world heritage site of Madhya Pradesh?

[A] Khajuraho group of monuments

[B] Rock shelters of Bhimbetka

[C] Buddhist monuments at Sanchi

[D] Udayagiri caves of Vidisha

48. Which of the following sports has been declared as the State sport of Madhya Pradesh?

[A] Table Tennis

[B] Football

[C] Mallakhamb

[D] Badminton

49. Which of the following is the scheme of Madhya Pradesh Government for improving the health and education status of the girls?

[A] Beti Bachao Beti Padhao Abhiyan

[B] Ladli Laxmi Yojana

[C] Gaon ki Beti Yojana

[D] Balika Shiksha and Health Protsahan Yojana

50. What is the upper limit of the subsidy given to the farmers under Khet-Talab Yojana of the Madhya Pradesh Government?

[A] ₹32,000

[B] ₹21,350

[C] ₹16,350

[D] None of the above

## खण्ड – ब / SECTION—B

## इलेक्ट्रिकल इंजीनियरिंग / Electrical Engineering

**51.** An ideal transformer has 200 primary and 800 secondary winding turns. The primary winding is connected to a 200 V, 50 Hz single-phase supply. The secondary winding supplies a load of 5 A at 0·8 lagging power factor. Determine *(i)* the primary current, *(ii)* the power consumed by load and *(iii)* the maximum flux in the core.

[A] 20 amp, 3200 watts, 4·5 mWb

[B] 5 amp, 3600 watts, 0·45 mWb

[C] 20 amp, 3600 watts, 0·45 mWb

[D] 5 amp, 3200 watts, 0·045 mWb

**52.** A delta zig-zag, three-phase transformer can be designated as

[A] $DZ_0$

[B] $DZ_{11}$

[C] $DZ_1$

[D] $DZ_6$

**53.** The commutator segments of DC machine are made up of

[A] brass

[B] copper

[C] hard drawn copper

[D] aluminium

**54.** Three-phase induction machine operates at low speed (crawling phenomenon) due to

[A] 5th space harmonics

[B] 7th time harmonics of voltage wave

[C] 7th space harmonics of air gap field

[D] unbalanced supply voltage

**55.** According to V and inverted V curve of the synchronous motor, which relation is right for synchronous motor operating at lagging power factor? [Neglect armature resistance ($r_a$)]

Where $V_t$ : terminal voltage

$E_f$ : Excitation voltage

$\delta$ : Torque angle

[A] $E_f \cos\delta > V_t$

[B] $E_f \cos\delta < V_t$

[C] $E_f \cos\delta = V_t$

[D] $V_t \cos\delta = E_f$

**56.** Electromagnetic torques in a synchronous generator and a synchronous motor are respectively

[A] independent from the direction of rotation for both generator and motor

[B] in the direction of rotation for both generator and motor

[C] in opposite direction of rotation for both generator and motor

[D] in opposite direction of rotation for generator and in same direction of rotation for motor

**57.** A stepper motor with 20° step angle is given 68 steps clockwise (cw) and 18 steps counter clockwise (ccw). Calculate the final position of the rotor. [Assume motor start at 0°]

[A] 60° ahead

[B] 280° ahead

[C] 210° behind

[D] 120° behind

**58.** Hysteresis loss and eddy current loss are used in which type of heating?

[A] Dielectric heating

[B] Induction heating of steel

[C] Resistance heating

[D] Induction heating of brass

**59.** What should be the speed range of $V/f$ controlled induction motor drive system? [$W_b$ is the base speed]

[A] 0 to $W_b$

[B] $W_b$ to $3W_b$

[C] 1·5 $W_b$ to $2W_b$

[D] $W_b$ to $2W_b$

**60.** A differential relay measures the vector difference between

[A] two currents

[B] two voltages

[C] two or more similar quantities

[D] frequencies

**61.** A single-phase induction motor extracts 10 A current from 200 V supply at 0·8 lagging power factor. What are the apparent power and useful power consumed respectively?

[A] 2000 VA and 1200 W

[B] 2000 W and 1200 W

[C] 2000 W and 1600 W

[D] 2000 VA and 1600 W

**62.** A relay used in backup protection is always _____ than the main protection relay.

[A] more sensitive

[B] faster

[C] slower

[D] accurate

**63.** Voltage regulation of a transmission line is defined as

[A] the ratio of no load minus full load receiving end voltage to no load sending voltage

[B] the ratio of full load receiving end voltage minus full load sending end voltage to full load sending end voltage

[C] the ratio of no load receiving end voltage minus full load receiving voltage to full load receiving end voltage

[D] the ratio of no load receiving end voltage minus no load sending end voltage to full load receiving end voltage

**64.** The bus voltage magnitude in a power system can be effectively controlled by controlling the

[A] phase angle of that bus

[B] amount of reactive power injected into that bus

[C] amount of active power injected into that bus

[D] phase angle and active power at that bus

**65.** The sending end bus is connected to receiving end bus of a lossless transmission line through a series reactance of $j10$ ohms. The line to line voltage is 115 kV r.m.s. The maximum real power that can be transferred by this three-phase system is

[A] 66·54 MW

[B] 345 MW

[C] 1889 MW

[D] 1322 MW

**66.** Effect of capacitance is neglected in

[A] short transmission line

[B] medium transmission line

[C] long transmission line

[D] None of the above

**67.** Choose the ***correct*** sentence related to power transfer.

[A] Active power transfer depends on load angle $\delta$

[B] Reactive power transfer depends on load angle $\delta$

[C] Active power depends on line voltage drop

[D] None of the above

**68.** In which HVDC transmission system, ground is used as return path?

[A] Only in monopolar link

[B] Only in bipolar link

[C] Only in homopolar link

[D] Both in monopolar and homopolar links

**69.** Which component ***cannot*** be used as VAR generator?

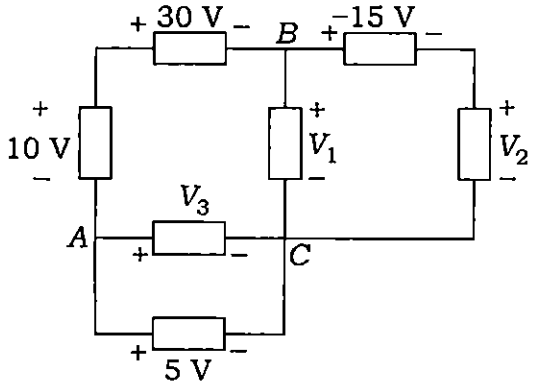
[A] Synchronous machine

[B] Capacitor

[C] Transformer

[D] Cable

**70.** Applying Kirchhoff's law to different loops in the figure given below, find the values of $V_1$ and $V_2$.




[A] $V_1 = 10$ V, $V_2 = 1{\cdot}5$ V

[B] $V_1 = -15$ V, $V_2 = 0$ V

[C] $V_1 = -10$ V, $V_2 = -1{\cdot}5$ V

[D] $V_1 = 15$ V, $V_2 = -1{\cdot}5$ V

**71.** A given function $f(t)$ can be represented by a Fourier series, if

[A] it is periodic

[B] it is single-valued

[C] it has a finite number of maxima and minima in any one period

[D] All of the above

**72.** Which of the following periodic functions possesses even symmetry?

[A] $\cos 3t$

[B] $\sin t$

[C] $t\cos 50t$

[D] $(t + t^2 + t^5)$

**73.** Double-energy transients are produced in circuits consisting of

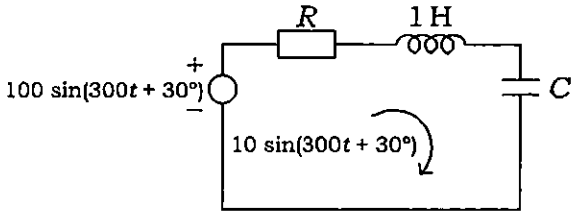
[A] two or more resistors

[B] resistance and inductance

[C] resistance and capacitance

[D] resistance, inductance and capacitance

**74.** In the series resonant circuit shown in the figure given below, the values of the voltage and current are respectively 100 sin $(300t + 30°)$ volts and 10 sin $(300t + 30°)$ ampere. Find the values of $R$ and $C$.



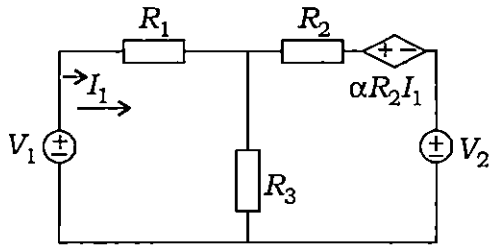

[A] $R = 10\ \Omega$, $C = 11{\cdot}11\ \mu$F

[B] $R = 10^3\ \Omega$, $C = 0{\cdot}33 \times 10^{-2}\ \mu$F

[C] $R = 0{\cdot}1\ \Omega$, $C = 9 \times 10^4\ \mu$F

[D] $R = 110\ \Omega$, $C = 300\ \mu$F

**75.** The $Z$ parameters of the two-port network ($r$-parameter equivalent circuit of common base transistor) shown below are



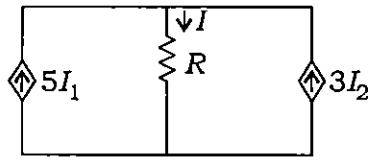

[A] $Z_{11} = R_1/R_3$ $Z_{21} = \alpha R_3 - R_2$
$Z_{12} = 1/R_3$ $Z_{22} = \alpha R_2 - R_3$

[B] $Z_{11} = R_1 - R_3$ $Z_{21} = \alpha R_2 + R_3$
$Z_{12} = 1/R_3$ $Z_{22} = R_3 - R_2$

[C] $Z_{11} = R_1 + R_3$ $Z_{21} = \alpha R_3 + R_2$
$Z_{12} = R_3$ $Z_{22} = R_2 + R_3$

[D] $Z_{11} = R_3/R_1$ $Z_{21} = \alpha R_2 - R_3$
$Z_{12} = -R_3$ $Z_{22} = \alpha R_3 - R_2$

**76.** Obtain the value of $I$ in the figure given below, if $I_1 = 3$ A, $I_2 = -2$ A in the dependent current sources.



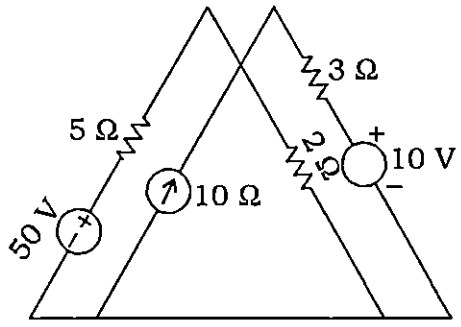

[A] 30 A

[B] 15 A

[C] 21 A

[D] 9 A

**77.** Using mesh analysis, find the current flow through the 50 V source in the network shown below.




[A] 4 A

[B] 5·481 A

[C] 3·3 A

[D] –2·5 A

**78.** A coil having an inductance and resistance of 50 mH and 10 Ω is connected in series with a capacitor and a 100 V, 1 kHz source. Obtain the value of capacitance that will cause a resonance in the circuit and also find the circuit current of resonance frequency.

[A] 0·5 μF and 1 A

[B] 0·05 μF and 0·1 A

[C] 0·25 μF and 1·1 A

[D] 0·35 μF and 1 A

**79.** A linear connected graph has $n$ nodes and $b$ branches. The number of link (co-tree branches) in the graph would always be equal to

[A] $b - n$

[B] $n - 1$

[C] $b - n - 1$

[D] $b - n + 1$

**80.** Which one of the following is ***not*** a source of magnetostatic field?

[A] A charge disc rotating at uniform speed

[B] A permanent magnet

[C] A DC current flowing in a wire

[D] An accelerating charge

**81.** Which of the following statements is ***not*** a characteristic of a static magnetic field?

[A] It is solenoidal

[B] It has no sinks or sources

[C] It is conservative

[D] Magnetic flux lines are always closed

**82.** In cylindrical coordinates, the equation

$$\frac{\partial^2 V}{\partial t^2}+\frac{1}{p}\frac{\partial V}{\partial p}+\frac{\partial^2 V}{\partial z^2}+10=0$$

is called

[A] Maxwell's equation

[B] Laplace's equation

[C] Poisson's equation

[D] Helmholtz's equation

**83.** The electric field component of an electromagnetic wave in free space is

$\vec{E}=10\cos(10^7 t+kz)\,\hat{a}y$ V/m

where $t$ is in second, $z$ is in metre. It can be inferred that

*(i)* the wave propagates along $+y$ direction.

*(ii)* the wave amplitude is 10 V/m.

*(iii)* the wave number $k = 0{\cdot}33$ rad/m.

*(iv)* the wavelength $\lambda = 188{\cdot}5$ m.

Which of the following pairs is ***correct***?

[A] *(i)* and *(ii)*

[B] *(ii)* and *(iv)*

[C] *(ii)* and *(iii)*

[D] *(ii)*, *(iii)* and *(iv)*

**84.** What is the major factor for determining whether a medium is lossy dielectric, lossless dielectric or good conductor?

[A] Reflection coefficient

[B] Loss tangent

[C] Constitutive parameters

[D] Attenuation constant

**85.** For a silicon $p$-$n$ junction at 300 K with doping concentration of $N_a = 10^{16}$ cm$^{-3}$ and $N_d = 10^{15}$ cm$^{-3}$, consider the built-in potential barrier at 0·635 V and permittivity of semiconductor as 11·7. The space charge width of the $p$-$n$ junction is

[A] 0·95 μm

[B] 0·095 μm

[C] 0·452 μm

[D] 1·95 μm

**86.** Consider the interface between a GaAs semiconductor and air. Let the refractive index of GaAs is 3·66. The approximate values of reflection coefficient and critical angle at semiconductor-air interface will be

[A] 0·33 and 30°

[B] 0·33 and 16°

[C] 0·033 and 16°

[D] 0·33 and 25°

**87.** The factors reducing the efficiency of Si solar cell are

[A] absorbed photons with $h\nu < E_g$ and short wavelength photons absorbed near the surface

[B] unabsorbed photons with $h\nu < E_g$ and short wavelength photons absorbed near the surface

[C] unabsorbed photons with $h\nu > E_g$ and short wavelength photons absorbed near the surface

[D] absorbed photons with $h\nu > E_g$ and short wavelength photons unabsorbed near the surface

**88.** According to Meissner effect

[A] the magnetic field lines will penetrate the sample

[B] a superconductor below its critical temperature expels all the magnetic field from the bulk of the sample

[C] the sample becomes diamagnetic substance

[D] the superconductor develops a magnetization by developing surface current

**89.** An electric dipole moment is a measure of

[A] electrostatic effects of a pair of opposite charges separated by a finite distance

[B] electrostatic effects of a pair of same charges separated by a finite distance

[C] magnetostatic effects of a pair of opposite charges separated by a finite distance

[D] None of the above

**90.** The rectifier employs negative feedback in electronic voltmeters. This is done

[A] to improve stability

[B] to overcome non-linearity of diodes

[C] to increase the overall gain

[D] None of the above

**91.** Which statement is/are ***correct*** regarding the probable error?

[A] It is determined by taking the arithmetic means of the multiple value or measurement obtained

[B] It is the maximum error which might have occurred during the measurement

[C] Both [A] and [B]

[D] None of the above

**92.** A problem occurs with the measurement of very high resistance because there are two resistive components which are

[A] volume and surface leakage resistance

[B] dummy and surface leakage resistance

[C] dummy and volume resistance

[D] None of the above

**93.** For measurement of parallel-connected inductance ($L_p$), the circuit is generally resonated using

[A] Kelvin clips

[B] a dummy inductor

[C] a reference inductor or work coil

[D] a variable capacitor

**94.** Sensitivity of the AC-bridge can be improved by

[A] increasing the level of the supply voltage

[B] using a more-sensitive null detector

[C] Both [A] and [B]

[D] None of the above

**95.** In RTD, the platinum is the most widely applicable resistance wire used because

[A] of its high stability and large operating range

[B] of its high sensitivity

[C] it requires no point sensing

[D] All of the above

**96.** Which of the following are the characteristics of the data acquisition systems?

[A] Settling time and data transfer rate/speed

[B] Resolution and non-linearity

[C] Resolution, non-linearity and settling time

[D] All of the above

**97.** If the signals of frequencies _____ are to be displayed, then post deflection acceleration is necessary to increase the brightness of the trace.

[A] more than 10 MHz

[B] less than 11 MHz

[C] more than 1 MHz

[D] equal to 2 MHz

**98.** Radiation pyrometers are generally used for a temperature range of

[A] 0 °C – 500 °C

[B] 1200 °C – 3500 °C

[C] 250 °C – 1000 °C

[D] –20 °C – 100 °C

**99.** The controlling torque of an electrical measuring instrument is proportional to

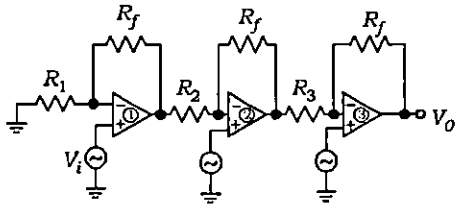
[A] $\theta^2$

[B] $\frac{1}{\theta}$

[C] $\sqrt{\theta}$

[D] $\theta$

**100.** Calculate the output voltage using the given circuit for resistor components $R_f = 470\ k\Omega$, $R_1 = 4{\cdot}3\ k\Omega$, $R_2 = 33\ k\Omega$, $R_3 = 33\ k\Omega$ for an input of 80 μV.




[A] 1·40 volts

[B] 1·78 volts

[C] 500 volts

[D] 2·59 volts

**101.** Find input current and output voltage for an inverting amplifier, which has $R_1 = 10\ k\Omega$, $R_f = 150\ k\Omega$ and input voltage = 1 V.

[A] $I_{in} = 7^{-4}$ mA, $V_o = -10$ V

[B] $I_{in} = 9^{-4}$ mA, $V_o = 15$ V

[C] $I_{in} = 10^{-2}$ mA, $V_o = 7$ V

[D] $I_{in} = 10^{-4}$ mA, $V_o = -15$ V

**102.** In a volt-ampere characteristics, for a *p-n* junction diode, the current $I$ is related to the voltage $V$ by the equation

[A] $I = I_0(e^{V/nV_T} - 1)$

[B] $I = nqV$

[C] $I = -qD_p\frac{dp}{dx}$

[D] $I = (e^{V/nI_0} - 1)$

**103.** In a full wave rectifier, DC load current is

[A] $I_{DC} = \frac{I_m}{\pi}$

[B] $I_{DC} = \frac{I_m}{2}$

[C] $I_{DC} = \frac{2I_m}{\pi}$

[D] $I_{DC} = \frac{I_m}{\sqrt{2}}$

**104.** Stability factor ($S$) is defined as

[A] $S = \frac{\Delta I_B}{\Delta I_{CD}}$

[B] $S = \frac{\Delta I_E}{\Delta I_{CO}}$

[C] $S = \frac{\Delta I_{CBO}}{\Delta I_{CO}}$

[D] $S = \frac{\Delta I_C}{\Delta I_{CO}}$

**105.** Simplify the Boolean expression of the given identity

$$(\bar{A}+C)(A+\bar{B})(A+B)$$

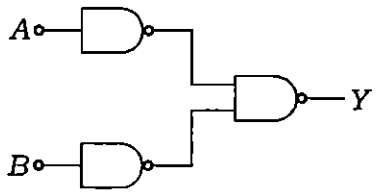
[A] $AB$

[B] $AC$

[C] $\overline{AB}$

[D] $BC$

**106.** The circuit diagram shown in the figure below performs the logic function of which gate?




[A] OR

[B] AND

[C] NOR

[D] Ex-OR

**107.** Convert the following function into canonical product of sum form, where

$$F(A,B,C) = \prod(0,1,2,5)$$

[A] $(A+B+C)(A+B+\bar{C})$
$(A+\bar{B}+C)(\bar{A}+B+\bar{C})$

[B] $(\bar{A}+\bar{B}+\bar{C})(A+B+C)$
$(\bar{A}+B+\bar{C})(A+\bar{B}+C)$

[C] $(A+\bar{B}+C)(\bar{A}+B+C)$
$(A+B+\bar{C})(\bar{A}+B+\bar{C})$

[D] $(\bar{A}+B+\bar{C})(A+\bar{B}+\bar{C})$
$(\bar{A}+\bar{B}+C)(A+\bar{B}+C)$

**108.** The given truth table is for

| Input | | Output |
|---|---|---|
| CLK | FF i/p | Q |
| 0 | X | No change |
| 1 | X | No change |
| ↑ | X | No change |
| X | 0 | No change |
| ↓ | 0 | No change |
| ↓ | 1 | Toggles |

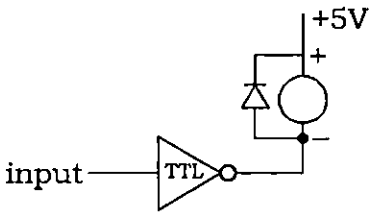
[A] TFF, positive edge triggered FF

[B] TFF, negative edge triggered FF

[C] DFF, edge triggered FF

[D] JKFF, positive edge triggered FF

**109.** Given diagram represents interfacing of TTL gate with




[A] relay

[B] motor

[C] solenoid

[D] piezo buzzer

**110.** Power diode is a two-terminal *p-n* junction device. Under reverse biased conditions, a small reverse current known as leakage current increases slowly in magnitude with the reverse bias voltage until the _____ is reached.

[A] threshold voltage

[B] avalanche or Zener voltage

[C] turn on voltage

[D] cut-in voltage

**111.** BJTs or MOSFETs, SITs or IGBTs can be assumed as ideal switches to explain the _____ techniques.

[A] voltage conversion

[B] current conversion

[C] power conversion

[D] frequency conversion

**112.** Which one of the following is defined as a bistable semiconductor component with at least three junctions that can be changed over from an off-state into an on-state or vice versa?

[A] Diode

[B] Transistor

[C] Uni-Junction Transistor (UJT)

[D] Thyristor

**113.** A TRIAC can be conducted in both directions and is normally used in AC phase control. It can be considered as two ____ connected in antiparallel.

[A] transistors

[B] diodes

[C] DIACs

[D] SCRs

**114.** A Gate-Turn-Off Thyristor (GTO) like a/an _____ can be turned on by applying a positive gate signal. However it can be turned off by a negative gate signal.

[A] DIAC

[B] SCR

[C] TRIAC

[D] IGBT

**115.** Which of the following are voltage-controlled devices?

[A] BJT and MOSFET

[B] BJT and IGBT

[C] MOSFET and IGBT

[D] MOSFET and diode

**116.** During turn-on, the IGBT behaves like a _____ and during turn-off, the IGBT behaves like a _____.

[A] MOSFET, BJT

[B] BJT, MOSFET

[C] BJT, diode

[D] MOSFET, diode

**117.** What is the preferable device to obtain controlled output voltages instead of diodes?

[A] Power controlled thyristor

[B] Current controlled thyristor

[C] Voltage controlled thyristor

[D] Phase controlled thyristor

**118.** Which one of the following electronic circuits converts a DC voltage source to an AC voltage source of specified magnitude and frequency?

[A] Chopper

[B] Inverter

[C] Converter

[D] Rectifier

**119.** What is the another name of DC-DC converters, which is useful for a high power applications?

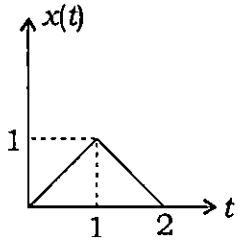
[A] Sensors

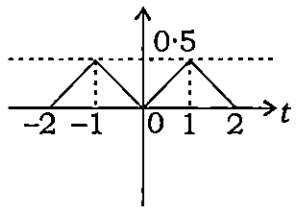
[B] Controllers

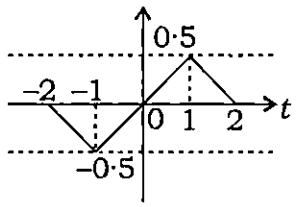
[C] Choppers

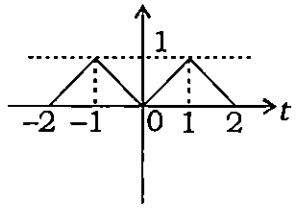
[D] Actuators

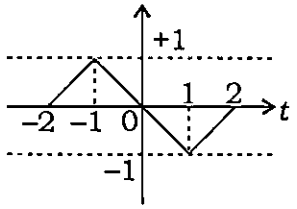
**120.** Determine the odd part of the following signal $x(t)$.




[A] 


[B] 


[C] 


[D] 


**121.** Check whether the following systems are time variant or time invariant :

*(i)* $y_1(t) = e^{x_1(t)}$

*(ii)* $y_2(t) = t\,x_2(t)$

[A] systems *(i)* and *(ii)* both are time variant

[B] system *(i)* is time variant but *(ii)* is time invariant

[C] system *(i)* is time invariant but *(ii)* is time variant

[D] systems *(i)* and *(ii)* both are time invariant

**122.** Find the transfer function of the LTI system given in the difference equation

$y(n) - 0{\cdot}5y(n-1) = x(n) + 0{\cdot}4x(n-1)$

[A] $H(z) = \dfrac{1+0{\cdot}4z^{-1}}{1+0{\cdot}5z^{-1}}$

[B] $H(z) = \dfrac{1+0{\cdot}4z^{-1}}{1-0{\cdot}5z^{-1}}$

[C] $H(z) = \dfrac{1-0{\cdot}5z^{-1}}{1+0{\cdot}4z^{-1}}$

[D] $H(z) = \dfrac{1+0{\cdot}5z^{-1}}{1-0{\cdot}4z^{-1}}$

**123.** Find the Laplace transform and ROC of the following signal

$$x(t) = e^{-4t}, t \geq 0$$

[A] $x(s) = \frac{8}{s^2 - 16}$, ROC is all points after the line $\sigma = -4$

[B] $x(s) = \frac{8}{s^2 - 16}$, ROC is all points in the s-plane in between the lines passing through $\sigma = -4$ and $\sigma = 4$

[C] $x(s) = \frac{-8}{s^2 - 16}$, ROC is all points after the line $\sigma = +4$

[D] None of the above

**124.** Which of the following functions presents the Discrete Fourier Transform (DFT) of sequence $x(n) = \left\{\underset{\uparrow}{\frac{1}{4}}, \frac{1}{4}, \frac{1}{4}\right\}$?

[A] $x(k) = 1 + 2\cos\left(\frac{2\pi k}{3}\right)$, $k = 0,1,\ldots,N-1$

[B] $x(k) = 1 + 2\sin\left(\frac{2\pi k}{3}\right)$, $k = 0,1,\ldots,N-1$

[C] $x(k) = 1 - 2\cos\left(\frac{2\pi k}{3}\right)$, $k = 0,1,\ldots,N-1$

[D] $x(k) = 1 - 2\sin\left(\frac{2\pi k}{3}\right)$, $k = 0,1,\ldots,N-1$

**125.** If input $x(n) = u(n) - u(n-3)$ and impulse response $h(n) = 3\delta(n-1) + 2\delta(n)$, then output $y(n)$ by circular convolution is

[A] $y(n) = \underset{\uparrow}{[5,3,2,5]}$

[B] $y(n) = \underset{\uparrow}{[3,2,5,5]}$

[C] $y(n) = \underset{\uparrow}{[2,3,5,5]}$

[D] $y(n) = \underset{\uparrow}{[2,5,5,3]}$

**126.** Number of complex additions in a 512-point radix-2 FFT is

[A] 2,61,632

[B] 2,62,144

[C] 4608

[D] 2304

**127.** Find the $z$-transform of input signal $x(n)=\{-2,0,1,-1,3\}$ and impulse response $h(n)=\{1,2,0,-1\}$. Also find its output $y(n)$.

[A] $X(z)=-2z^{-1}+z^{-2}-z^{-3}+3z^{-4}$

$H(z)=1+2z^{-1}+z^{-3}$

$Y(z)=2-4z^{-1}+z^{-2}+3z^{-3}+$

$z^{4}+5z^{-5}+z^{-6}-3z^{-7}$

[B] $X(z)=-2+z^{-2}-z^{-3}+3z^{-4}$

$H(z)=1+2z^{-1}-z^{-3}$

$Y(z)=-2-4z^{-1}+z^{-2}+3z^{-3}+$

$z^{-4}+5z^{-5}+z^{-6}-3z^{-7}$

[C] $X(z)=-2z^{-2}+z^{-1}+z^{-3}+3z^{-4}$

$H(z)=1z^{-1}+2z^{-2}-z^{-3}$

$Y(z)=2+4z^{-1}+z^{-2}+3z^{-3}+$

$z^{-4}+5z^{-5}+z^{-6}-3z^{-7}$

[D] $X(z)=-2-z^{-2}+z^{-3}+3z^{-4}$

$H(z)=1-2z^{-1}-z^{-3}$

$Y(z)=-2-4z^{-1}+z^{-2}+3z^{-3}+$

$z^{-4}+5z^{-5}+z^{-6}+3z^{-7}$

**128.** Find the impulse response $h(n)$ of the factor of 2-interpolator

$$y(n)=x_u(n)+\frac{1}{2}(x_u[n-1]+x_u[n+1])$$

where $x_u(n)=\delta(n)$

[A] $h(n)=\{0{\cdot}5,1,0{\cdot}5\},-1\le n\le 1$

[B] $h(n)=\{-0{\cdot}5,1,-0{\cdot}5\},-1\le n\le 1$

[C] $h(n)=\{-0{\cdot}5,0,0{\cdot}5\},-1\le n\le 1$

[D] $h(n)=\{-0{\cdot}5,1,0{\cdot}5\},-1\le n\le 1$

**129.** In the equation $\omega_o = \Omega_o T$, the units of $\omega_o$, $\Omega_o$ and $T$ are _____ respectively.

[A] radians per second, radians per sample and seconds

[B] radians per cycle, radians per sample and seconds

[C] radians per sample, radians per sample and seconds

[D] radians per cycle, radians per second and seconds

**130.** For a unity feedback control system with forward path gain

$$G(s)=\frac{25}{s(s+10)}$$

the peak time is

[A] 0·75 second

[B] 0 second

[C] 0·25 second

[D] infinite second

**131.** For a unity feedback control system with open-loop transfer function

$$G(s)=\frac{k}{s(s+1)(s+2)(s+4)}$$

the system becomes marginally stable for which one of the under mentioned value of $k$?

[A] 1·47

[B] 147·0

[C] 1·047

[D] 14·7

**132.** For the linear time invariant system, the transfer function of the system is the Laplace transform of the

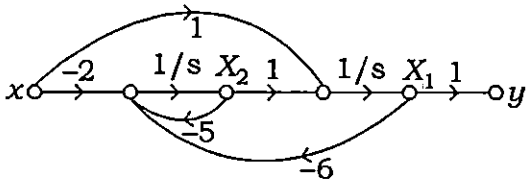
[A] impulse response assuming all the initial conditions to be zero

[B] unit step response assuming all the initial conditions to be zero

[C] unit ramp response assuming all the initial conditions to be zero

[D] unit parabolic response assuming all the initial conditions to be zero

**133.** Consider a system whose signal flow graph is shown below :




The above system is

[A] controllable only

[B] observable only

[C] controllable and observable

[D] controllable with step input and observable with ramp input

**134.** The Nyquist plot of an open-loop transfer function $G(j\omega)H(j\omega)$ of a system encloses the $(-1, j0)$ point. The gain margin of the system is

[A] zero

[B] infinite

[C] greater than zero

[D] less than zero

**135.** Without affecting steady state error, the maximum overshoot can be decreased by incorporating

[A] proportional error control

[B] derivative error control

[C] on-off control

[D] integral error control

**136.** For a second order system, natural frequency of oscillation is 10 rad/sec and damping ratio is 0·1. What is 2% settling time?

[A] 0·2 sec

[B] 1 sec

[C] 2 sec

[D] 4 sec

**137.** To increase the damping of a heavily underdamped system without affecting steady state response, the compensator used is

[A] phase lag

[B] phase lead

[C] phase lag-lead

[D] phase lag-lag

**138.** The second order control system exhibits 100% overshoot. Its damping coefficient is

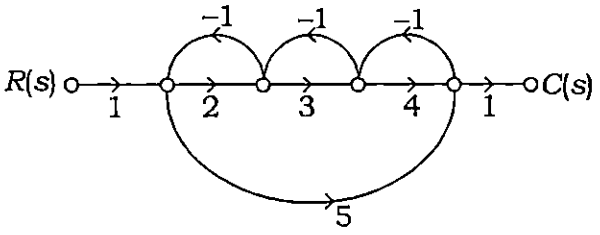
[A] less than 1

[B] greater than 1

[C] 0

[D] 1

**139.** For the signal flow graph given below, the closed loop transfer function $\frac{C(s)}{R(s)}$ is




[A] $\frac{44}{23}$

[B] $\frac{29}{19}$

[C] $\frac{44}{19}$

[D] $\frac{29}{23}$

**140.** In 8085 microprocessor, _____ flag is not available for the use of the programmer.

[A] zero

[B] carry

[C] auxiliary carry

[D] sign

**141.** Time delay of a looping program in 8085 microprocessor based system is dependent on

[A] the number of T-states in the delay loop

[B] the clock frequency of the processor

[C] the number of times the loop is repeated

[D] All of the above

**142.** The arithmetic and logic instructions in 8085 without ending with letter 'I' are _____ byte instructions.

[A] one

[B] two

[C] three

[D] four

**143.** The 'NOP' instruction in 8085 microprocessor falls under _____ type of instruction.

[A] data transfer

[B] machine control

[C] logical

[D] arithmetic

**144.** If clock frequency of an 8085 microprocessor based system is 2 MHz, then what is the time to execute MVI instruction? (MVI instruction requires 7 clock periods)

[A] 1·5 μs

[B] 2·5 μs

[C] 3·5 μs

[D] Cannot be stated

**145.** The status and control signals during interrupt acknowledgement machine cycles are

[A] $IO/\overline{M} = 0; S_1 = 1; S_0 = 1$

[B] $IO/\overline{M} = 1; S_1 = 0; S_0 = 0$

[C] $IO/\overline{M} = 1; S_1 = 1; S_0 = 0$

[D] $IO/\overline{M} = 1; S_1 = 1; S_0 = 1$

**146.** The hardware requirement of a memory mapped I/O _____ peripheral I/O.

[A] is less than the

[B] is same as that of the

[C] is more than the

[D] Cannot be compared with

**147.** What will be the content of the output port, if the following code is executed on 8085 microprocessor?

```
IN   FF
XRA  A
OUT  FE
```

[A] OO

[B] FE

[C] FF

[D] None of the above

**148.** The machine cycle $M_1$ of the interrupt acknowledge is identical with the opcode fetch cycle in 8085 with exception that

[A] the $\overline{INTA}$ signal is sent out instead of $\overline{RD}$ signal

[B] the status lines $IO/\overline{M}$, $S_0$ and $S_1$ are 1,1,1 instead of 0,1,1

[C] Both [A] and [B]

[D] the $\overline{RD}$ signal is sent out instead of $\overline{INTA}$ signal

**149.** In memory mapped I/O, _____ operation(s) can be directly performed with I/O data.

[A] arithmetic

[B] logical

[C] arithmetic and logical

[D] control

**150.** Singly-excited magnetic system is applicable in which machine?

[A] Synchronous motor

[B] DC motor

[C] Reluctance motor

[D] DC generator

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