

Do not open this booklet until you are asked to do so.

इस पुस्तिका को तब तक न खोलें जब तक कहा ना जाए।

**QUESTION BOOKLET**  
प्रश्न पुस्तिका

**Subject: Mechanical Degree**  
विषय:- यांत्रिकी डिग्री

**Code: B**  
कोड: ब

**Duration: 2 hours**  
समय : 2 घण्टे

**Max. Marks: 100**  
अधिकतम अंक: 100

1. Candidate's Roll no. <b>परीक्षार्थी क्रमांक</b> <input type="text"/>	2. Question booklet Serial number : <b>प्रश्न पुस्तिका क्रमांक:</b> <input type="text"/>
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**Important Instructions**  
**महत्वपूर्ण निर्देश**

<p>1. Number of pages in the booklet : 14</p> <p>2. This Booklet is divided into Two Parts namely Part A and Part B. Part A contains 40 questions and Part B contains 60 questions.</p> <p>3. Questions in Part A are in both English and Hindi language. Questions in part B are in English only.</p> <p>4. All questions carry equal marks.</p> <p>5. Please use <b>Black ink Ball Point Pen</b> to fill OMR answer sheet.</p> <p>6. Answer all the questions in OMR sheet.</p> <p>7. Each question has four alternative responses marked serially as A,B,C, and D. You have to darken only one circle in the supplied OMR sheet for each question.</p> <p>8. <b>Negative marking</b> will be done 1/3 part of the mark(s) of question in case of each wrong/multiple reply will be deducted.</p> <p>9. If more than one options for an answer are marked correct then it will be treated as wrong answer.</p> <p>10. Rough work should be done only in the space provided at the end of the Question Booklet</p> <p>11. Use of mobile phone or any type of electronic device including calculator is strictly prohibited in the examination hall. Any candidate found with such objectionable material/device will be strictly dealt as per rules.</p> <p>12. Please hand over both Answer Sheet and the Question Booklet to the Invigilator before leaving the Examination Hall.</p> <p>13. In case of any variation in English or Hindi version, English version should be treated as correct.</p> <p><b>Warning: If a candidate is found copying or if any unauthorized material is found in his/her possession, F.I.R will be lodged against his/her in the police station and he/she will be prosecuted under section 3 of the R.P.F. (Prevention of unfair means) Act, 1992.</b></p>	<p>1. पुस्तिका में पृष्ठों की संख्या:- 14</p> <p>2. पुस्तिका में प्रश्नों को दो पार्ट में विभाजित किया गया है, क्रमशः ए एवं बी. पार्ट ए में 40 प्रश्न तथा पार्ट बी में 60 प्रश्न दिये हुए हैं।</p> <p>3. पार्ट ए में प्रश्न हिन्दी एवं अंग्रेजी (द्विभाषीय) में दिये हुए हैं। पार्ट बी में प्रश्न अंग्रेजी में दिये हुए हैं।</p> <p>4. सभी प्रश्नों के अंक समान है।</p> <p>5. ओ एम आर पत्रक (OMR) भरने के लिए केवल <b>काली स्याही वाले बॉल प्वाइंट पेन</b> का ही प्रयोग करें।</p> <p>6. सभी प्रश्नों के उत्तर पत्रक (OMR) पर दें।</p> <p>7. प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं, जिन्हें क्रमशः A, B, C, D अंकित किया गया है। अभ्यर्थी को सही उत्तर निर्दिष्ट करते हुए उनमें से केवल एक गोले अथवा बबल को उत्तर-पत्रक पर काले बॉल प्वाइंट पेन से गहरा करना है।</p> <p>8. प्रत्येक गलत उत्तर के लिए प्रश्न अंक का 1/3 भाग काटा जायेगा। गलत उत्तर से तात्पर्य अशुद्ध उत्तर अथवा किसी भी प्रश्न के एक अधिक उत्तर से है।</p> <p>9. एक से अधिक उत्तर देने की दशा में प्रश्न के उत्तर को गलत माना जाएगा।</p> <p>10. रफ कार्य केवल परीक्षा पुस्तिका के अंतिम पृष्ठ पर दिये गये खाली जगह पर ही करें।</p> <p>11. मोबाईल फोन अथवा इलेक्ट्रॉनिक यंत्र (केलक्यूलेटर सहित) का परीक्षा हॉल में प्रयोग पूर्णतया वर्जित है। यदि किसी अभ्यर्थी के पास ऐसी कोई वर्जित सामग्री मिलती है तो उसके विरुद्ध नियमानुसार कार्यवाही की जायेगी।</p> <p>12. परीक्षा कक्ष छोड़ने से पहले प्रश्न पत्र एवं उत्तर पत्र की पुस्तिका कक्ष निरीक्षक को लौटा दें।</p> <p>13. अंग्रेजी या हिंदी संस्करणों में किसी भी असमानता के मामले में अंग्रेजी संस्करण को सही माना जायेगा।</p> <p><b>चेतावनी:-</b>अगर कोई अभ्यर्थी नकल करते पकड़ा जाता है या उसके पास से कोई अनधिकृत सामग्री पाई जाती है, तो उस अभ्यर्थी के विरुद्ध पुलिस में प्राथमिकी दर्ज कराई जायेगी और आ.पी.ई. (अनुसूचित साधनों की रोकथाम) अधिनियम, 1992 के नियम 3 के तहत कार्यवाही की जायेगी।</p>
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## Part A (English)

- Q.1 Relics of ancient civilizations "**GILUND**" were found near which river and in which district?  
A. Ruparel, Bharatpur  
B. Banas, Rajsaman  
C. Luni, Pali  
D. Khari, Bhilwara
- Q.2 The language of the book, '*Prithviraj Vijaya*' written by **Jayanayak Bhatt** was:  
A. Persian  
B. Dingal  
C. Sanskrit  
D. Pingal
- Q.3 The copper plant at Khetri and zinc plant in Debari was established in 1960's with support from UK. Today majority holdings in Debari plant has been sold to which industrial group?  
A. Vendanta  
B. Reliance  
C. Tata  
D. Birla
- Q.4 **Ira; Chap and Moran** are tributaries of which river?  
A. Banas  
B. Chambal  
C. Luni  
D. Mahi
- Q.5 The biggest cannon in the world is in which fort?  
A. Chittorgarh Fort  
B. Mehrangarh Fort  
C. Jaigarh Fort  
D. Nahargarh Fort
- Q.6 American Cotton (Kapas) is grown in which district of Rajasthan?  
A. Ganganagar  
B. Sikar  
C. Dausa  
D. Bharatpur
- Q.7 Which Jaipur ruler can be credited for having the buildings of Jaipur painted pink?  
A. Sawai Mansingh  
B. Kalyan Singh  
C. Sawai Ram Singh II  
D. Mirza Raja Jaisingh
- Q.8 **Bharateshwar Bahubali Ghor** (Year 1168) is the oldest Jain literary work of Rajasthani language. This describes the fierce fight between **Bharateshwar & Bahubali**. Who is the writer of this book?  
A. Jindutt Suri  
B. Brijsen Suri  
C. Palhan  
D. Vijaysen Suri
- Q.9 "**Saraswati Bhandar**" a museum famous for paintings is located in?  
A. Jodhpur  
B. Udaipur  
C. Bundi  
D. Kota
- Q.10 Which bank on 15 November 2014 won Custodian of the Year 2014 award?  
A. Standard Chartered Bank  
B. Deutsche Bank  
C. Industrial & Commercial Bank of China  
D. Royal Bank of Canada
- Q.11 **Mangalyaan** has been named amongst the first best \_\_\_\_\_ inventions of 2014 in the list published by Time magazine?  
A. 100  
B. 50  
C. 5  
D. 25
- Q.12 Barack Obama became the \_\_\_\_\_ President of America to participate in India's Republic Day celebrations during January 26, 2015?  
A. Second  
B. First  
C. Third  
D. Fourth

- Q.13 Indian Railways has recently flagged off the first CNG (Compressed Natural Gas) based two trains from a station in which state?  
 A. Bihar  
 B. Jammu and Kashmir  
 C. Haryana  
 D. Gujarat
- Q.14 Recently American geologists discovered the most abundant mineral named as \_\_\_\_\_ on earth's lower mantle.  
 A. Calcite  
 B. Aragonite  
 C. Muscovite  
 D. Bridgmanite
- Q.15 World Health Organization, in November 2014, declared following country as free of the Ebola virus?  
 A. Democratic Republic of Congo  
 B. Nigeria  
 C. Liberia  
 D. Sudan
- Q.16 Who among the following in January 2015 took charge as the first vice-chairman of the newly-created *NITI Aayog*?  
 A. V. K. Saraswat  
 B. Bibek Debroy  
 C. Sindhushree Khullar  
 D. Arvind Panagariya
- Q.17 Time bound Guarantee for per household per year under MGNREG  
 A. More than 100 days  
 B. Up to 100 days  
 C. 50 days  
 D. 75 days
- Q.18 Wage and Material ratio for permissible works under MGNREGA  
 A. 50:50  
 B. 40 :60  
 C. 60:40  
 D. 30:70
- Q.19 In 2013-14, total persons worked under MGNREGA in Rajasthan are  
 A. 40-50 Lakh  
 B. 30-40 Lakh  
 C. Less than 20 lakh  
 D. More than 50 Lakh
- Q.20 Minimum percentage of Women in total under MGNREGA Work should be:  
 A. At least half  
 B. At least one-third  
 C. One-fourth  
 D. Two-third
- Q.21 Employment is provided under MGNREGA within  
 A. A week of application  
 B. 15 days of application  
 C. A month of application  
 D. None of these
- Q.22 Which statement is valid?  
 A. 1KB = 1024 bytes  
 B. 1 MB=2048 bytes  
 C. 1 MB = 1000 kilobytes  
 D. 1 KB = 1000 bytes
- Q.23 The octal equivalent of 111010 is  
 A. 81  
 B. 72  
 C. 71  
 D. None of above
- Q.24 Antivirus software is an example of:  
 A. Application software  
 B. Office software  
 C. Operating system  
 D. Utility software
- Q.25 A Student wants to create "Digital story Collection" on the famous storyline "Rabbit and the tortoise. He has downloaded some images of tortoise, rabbit and forest. He wants to add watermarks, stylish text and images but is not interested in any animation. Which office tool should he use?  
 A. Word processing Software  
 B. Presentation software  
 C. Spreadsheet software  
 D. Database management system

- Q.26 WAN stands for  
 A. Wap Area Network  
 B. Wide Area Network  
 C. Wide Array Net  
 D. Wireless Area Network
- Q.27 There are eight mango trees in a straight line. The distance between each mango tree with other is 3 metres. What is the distance between first tree and eighth tree?  
 A. 24 m  
 B. 27 m  
 C. 30 m  
 D. 21 m
- Q.28 A father is 30 years older than his son. He will be three times as old as his son after 5 years. What is the father's present age?  
 A. 35  
 B. 45  
 C. 40  
 D. 30
- Q.29 If 34 men completed  $\frac{2}{5}$ th of a work in 8 days, working 9 hours a day. How many more men should be engaged to finish the rest of the work in 6 days, working 9 hours a day?  
 A. 89  
 B. 98  
 C. 102  
 D. 142
- Q.30 A man wants to reach a window which is 40 feet above the ground. The distance from the foot of the ladder to the wall is 9 feet. How long should the ladder be?  
 A. 9 feet  
 B. 81 feet  
 C. 41 feet  
 D. 49 feet
- Q.31 Choose the correct alternative that will continue the same pattern and fill in the blank spaces.  
 11, 13, 17, 19, 23, 29, 31, 37, 41, \_\_\_\_  
 A. 43  
 B. 47  
 C. 51  
 D. 53
- Q.32 Choose the correct alternative that will continue the same pattern and fill in the blank spaces.  
 15, 31, 63, 127, 255, \_\_\_\_  
 A. 513  
 B. 511  
 C. 523  
 D. 517
- Q.33 In a certain code DOWN is written as 5@9# and NAME is written as #6%3. How would MODE be written?  
 A. %653  
 B. %@63  
 C. %5@3  
 D. %@53
- Q.34 At what angle the hands of the clock inclined at 15 minutes past 5 ?  
 A.  $52\frac{1}{2}$  degrees  
 B.  $67\frac{1}{2}$  degrees  
 C.  $88\frac{1}{2}$  degrees  
 D. 93 degrees
- Q.35 Give the correct option in the following sentences:  
**the/gifts/young/ones/on/give/elders/festivals**  
 A. young ones give gifts on festivals to elders  
 B. elders give the young ones gifts on festivals  
 C. ones give gifts the elders, young ones on festivals  
 D. give gifts to elders and young ones on festivals
- Q.36 Make affirmatives of following negative:  
 I haven't had any tea  
 A. I have tea  
 B. I have had some tea  
 C. I am having tea  
 D. I has some tea

- Q.37 Fill in the blanks with appropriate articles:  
 \_\_\_\_\_ passengers waited as \_\_\_\_\_ flying mail was \_\_\_\_\_ hour late.  
 A. The, a, an B. An, the, a  
 C. The, the, an D. The, an, the
- Q.38 'पक्षीवृन्द नभ में विचरते हैं।' रेखांकित शब्द का वचन है—  
 A. बहुवचन B. एकवचन  
 C. द्विवचन D. इनमें से कोई नहीं
- Q.39 'संसार के सभी प्राणी केवल अपनी आँखों से ही देख सकते हैं।' वाक्य का रेखांकित अंश कौनसा कारक है  
 A. कर्ता B. कर्म  
 C. करण D. अधिकरण
- Q.40 'पं. जगन्नाथ मिश्र बहुत बड़े पंडित थे।' वाक्य के रेखांकित शब्द से भाववाचक संज्ञा बनाइए  
 A. पंडिताइन B. पांडित्व  
 C. पंडा D. इनमें से कोई नहीं

#### Part A (Hindi)

- Q.1 प्राचीन सभ्यता 'गिलूण्ड' के अवशेष किसी नदी के किनारे और किस जिले में मिले हैं?  
 A. रूपारेल, भरतपुर B. बनास, राजसमन्द  
 C. लूनी, पाली D. खारी, भीलवाड़ा
- Q.2 जयानक भट्ट रचित 'पृथ्वीराज विजय' की भाषा थी—  
 A. फारसी B. डिंगल  
 C. संस्कृत D. पिंगल
- Q.3 खेतड़ी का तांबा संयंत्र अमेरिकी कंपनी के सहयोग से और देवारी का जस्ता संयंत्र ब्रिटेन के सहयोग से 1960 के दशक में स्थापित किया गया। अब देवारी संयंत्र का अधिकांश हिस्सा इस समूह को बेच दिया गया है।  
 A. वेदान्ता B. रिलायन्स  
 C. टाटा D. बिड़ला
- Q.4 ईरा, चाप और मोरन, किस नदी की सहायक है?  
 A. बनास B. चम्बल  
 C. लूनी D. माही
- Q.5 विश्व की सबसे बड़ी तोप किस किले में स्थित है?  
 A. चित्तौड़गढ़ दुर्ग B. मेहरानगढ़ दुर्ग  
 C. जयगढ़ दुर्ग D. नाहरगढ़ दुर्ग
- Q.6 अमेरिकन कपास राजस्थान के किस जिले में होती है?  
 A. श्रीगंगानगर B. सीकर  
 C. दौसा D. भरतपुर
- Q.7 जयपुर की इमारतों पर गुलाबी रंग करवाने का श्रेय इन्हें दिया जाता है—  
 A. सवाई मानसिंह B. कल्याण सिंह  
 C. सवाई रामसिंह द्वितीय D. मिर्जा राजा जयसिंह

- Q.8 भरतेश्वर बाहुबलि घोर (1168 ई.) राजस्थानी भाषा का सबसे प्राचीन जैन ग्रन्थ है, जिसमें भरतेश्वर और बाहुबलि के बीच हुए घोर युद्ध का वर्णन है। इसके लेखक कौन थे?
- A. जिनदत्त सूरि  
B. ब्रजसेन सूरि  
C. पल्हण  
D. विजयसेन सूरि
- Q.9 चित्र कला के लिए प्रसिद्ध संग्रहालय 'सरस्वती भण्डार' कहां है?
- A. जोधपुर  
B. उदयपुर  
C. बूंदी  
D. कोटा
- Q.10 किस बैंक ने नवम्बर 2014 में कस्टडियन ऑफ द ईयर 2014 का खिताब जीता?
- A. स्टैंडर्ड चार्टर्ड बैंक  
B. ड्यूश बैंक  
C. इण्डस्ट्रीयल एण्ड कॉमर्शियल बैंक ऑफ चाइना  
D. रॉयल बैंक ऑफ कनाडा
- Q.11 टाइम पत्रिका ने मंगलयान को 2014 के पहले सर्वश्रेष्ठ ..... आविष्कारों के बीच में नामित किया है।
- A. 100  
B. 50  
C. 5  
D. 25
- Q.12 बराक ओबामा 26 जनवरी 2015 के दौरान भारत के गणतंत्र दिवस समारोह में भाग लेने वाले..... अमेरिकन राष्ट्रपति हैं?
- A. दूसरे  
B. पहले  
C. तीसरा  
D. चौथा
- Q.13 भारतीय रेल ने प्रथम सीएनजी (कंप्रेसड नेचुरल गैस) आधारित दो रेलगाड़ी किस राज्य के स्टेशन से रवाना की?
- A. बिहार  
B. जम्मू एवं कश्मीर  
C. हरियाणा  
D. गुजरात
- Q.14 हाल ही में अमेरिकी भूवैज्ञानिकों को पृथ्वी की निचली सतह पर सबसे प्रचुर मात्रा में ..... खनिज की खोज की।
- A. केलसाइट  
B. एरेगोनाइट  
C. मास्कोवाइटी  
D. ब्रिजमेनाइट
- Q.15 विश्व स्वास्थ्य संगठन ने नवंबर 2014 में किस देश को ईबोला वायरस से मुक्त देश घोषित किया है?
- A. लोकतांत्रिक गणराज्य कांगो  
B. नाइजीरिया  
C. लाइबेरिया  
D. सूडान
- Q.16 निम्नलिखित में से किसने जनवरी 2015 में नवनिर्मित नीति आयोग के उपाध्यक्ष का कार्यभार संभाला?
- A. वी.के. सारस्वत  
B. बिबेक देबरॉय  
C. सिंधुश्री खुल्लर  
D. अरविंद पनगडिया
- Q.17 मनरेगा के तहत प्रति वर्ष प्रति घर के लिए समय बाध्य गारंटी—
- A. 100 दिनों से अधिक  
B. 100 दिन तक के लिए  
C. 50 दिन  
D. 75 दिन
- Q.18 मनरेगा के तहत अनुमत कार्यों हेतु वेतन और सामग्री अनुपात—
- A. 50:50  
B. 40:60  
C. 60:40  
D. 30:70
- Q.19 2013-14 में मनरेगा के तहत राजस्थान में कार्य करने वाले कुल व्यक्ति—
- A. 40-50 लाख  
B. 30-40 लाख  
C. 20 लाख से कम  
D. 50 लाख से ज्यादा

- Q.20 मनरेगा कार्यो में महिलाओं का न्यूनतम प्रतिशत होना चाहिए—  
 A. कम से कम 1/2 महिलाएं  
 B. कम से कम 1/3 महिलाएं  
 C. 1/4 महिलाएं  
 D. 2/3 महिलाएं
- Q.21 मनरेगा के तहत रोजगार प्रदान किया जायेगा—  
 A. प्रार्थना पत्र के एक सप्ताह में  
 B. प्रार्थना पत्र के 15 दिन में  
 C. प्रार्थना पत्र के एक माह में  
 D. इनमें से कोई नहीं
- Q.22 कौनसा बयान मान्य है—  
 A. 1केबी = 1024 बाइट्स  
 B. 1एमबी = 2048 बाइट्स  
 C. 1एमबी = 1000 किलोबाइट  
 D. 1केबी = 1000 बाइट्स
- Q.23 111010 का अष्टाधारी बराबर (ऑक्टल इक्विवलेंट) है—  
 A. 81  
 B. 72  
 C. 71  
 D. उपरोक्त में से कोई नहीं
- Q.24 एंटीवायरस सॉफ्टवेयर निम्न का एक उदाहरण है—  
 A. आवेदन सॉफ्टवेयर  
 B. कार्यालय सॉफ्टवेयर  
 C. ऑपरेटिंग सिस्टम  
 D. उपयोगिता सॉफ्टवेयर
- Q.25 एक छात्र प्रसिद्ध कहानी "खरगोश और कछुआ पर" डिजिटल कहानी संग्रह 'बनाना चाहता है। वह कछुआ, खरगोश और जंगल के कुछ छवियों को डाउनलोड करता है। वह वाटरमार्क स्टाइलिश पाठ और छवियों को जोड़ना चाहता है, लेकिन किसी भी एनीमेशन में कोई दिलचस्पी नहीं है। उसे .....का उपयोग करना चाहिए—  
 A. वर्ड प्रोसेसिंग सॉफ्टवेयर  
 B. प्रस्तुति सॉफ्टवेयर  
 C. स्प्रेडशीट सॉफ्टवेयर  
 D. डेटाबेस प्रबंधन प्रणाली
- Q.26 वैन (WAN) का अभिप्राय है—  
 A. वैप एरिया नेटवर्क  
 B. वाइड एरिया नेटवर्क  
 C. वाइड अरे नेट  
 D. वायरलेस एरिया नेटवर्क
- Q.27 एक सीधी लाइन में आठ आम के पेड हैं। प्रत्येक आम के पेड की दूरी दूसरे से 3 मीटर की है। पहले एवं आठवें पेड के बीच की दूरी क्या है?  
 A. 24 मी  
 B. 27 मी  
 C. 30 मी  
 D. 21 मी
- Q.28 एक पिता अपने पुत्र से 30 वर्ष बड़ा है। वह पांच वर्ष बाद अपने पुत्र से 3 गुना बड़ा हो जाएगा। पिता की वर्तमान आयु क्या है?  
 A. 35  
 B. 45  
 C. 40  
 D. 30
- Q.29 यदि 34 आदमी 2/5 काम, 8 दिन में प्रतिदिन 9 घंटे करके पूरा करते हैं, तो शेष कार्य को 6 दिन में प्रतिदिन 9 घंटे कार्य करके पूरा करने के लिए कितने अधिक आदमियों की आवश्यकता होगी?  
 A. 89  
 B. 98  
 C. 102  
 D. 142
- Q.30 एक आदमी एक खिड़की तक पहुंचना चाहता है जो जमीन से 40 फीट ऊपर है। सीढ़ी का निचला हिस्सा (पैर) दिवार से 9 फुट की दूरी पर है। सीढ़ी कितनी लम्बी होगी?  
 A. 9 फीट  
 B. 81 फीट  
 C. 41 फीट  
 D. 49 फीट
- Q.31 सही विकल्प का चयन करें जो नीयत पैटर्न को जारी रखेगा और रिक्त स्थान में भरें—  
 11, 13, 17, 19, 23, 29, 31, 37, 41,.....  
 A. 43  
 B. 47  
 C. 51  
 D. 53

- Q.32 सही विकल्प का चयन करें जो नीयत पैटर्न को जारी रखेगा और रिक्त स्थान में भरें—  
15, 31, 63, 127, 255,.....
- A. 513  
B. 511  
C. 523  
D. 517
- Q.33 एक खास कोड में DOWN को 5@9# के रूप में लिखा जाता है एवं NAME को #6%3 के रूप में लिखा जाता है, तो MODE को कैसे लिखा जाएगा?
- A. %653  
B. %@63  
C. %5@3  
D. %@53
- Q.34 5 बजकर 15 मिनट पर घड़ी की सुईयों का कोण क्या होगा?
- A.  $52\frac{1}{2}$  डिग्री  
B.  $67\frac{1}{2}$  डिग्री  
C.  $88\frac{1}{2}$  डिग्री  
D. 93 डिग्री
- Q.35 Give the correct option in the following sentences:  
**the/gifts/young/ones/on/give/elders/festivals**
- A. young ones give gifts on festivals to elders  
B. elders give the young ones gifts on festivals  
C. ones give gifts the elders, young ones on festivals  
D. give gifts to elders and young ones on festivals
- Q.36 Make affirmatives of following negative: I haven't had any tea
- A. I have tea  
B. I have had some tea  
C. I am having tea  
D. I has some tea
- Q.37 Fill in the blanks with appropriate articles:  
\_\_\_\_\_ passengers waited as \_\_\_\_\_ flying mail was \_\_\_\_\_ hour late.
- A. The, a, an  
B. An, the, a  
C. The, the, an  
D. The, an, the
- Q.38 'पक्षीवृन्द नभ में विचरते हैं।' रेखांकित शब्द का वचन है—
- A. बहुवचन  
B. एकवचन  
C. द्विवचन  
D. इनमें से कोई नहीं
- Q.39 'संसार के सभी प्राणी केवल अपनी आँखों से ही देख सकते हैं।' वाक्य का रेखांकित अंश कौनसा कारक है
- A. कर्ता  
B. कर्म  
C. करण  
D. अधिकरण
- Q.40 'पं. जगन्नाथ मिश्र बहुत बड़े पंडित थे।' वाक्य के रेखांकित शब्द से भाववाचक संज्ञा बनाइए
- A. पंडिताइन  
B. पांडित्व  
C. पंडा  
D. इनमें से कोई नहीं



## Part B

- Q.41 A motor boat whose speed in still water is 15 km/hr goes 30 km downstream and comes back in a total time of four and a half hour. The stream has a speed of:  
A. 3 km/hr  
B. 4 km/hr  
C. 5 km/hr  
D. 6 km/hr
- Q.42 A body of mass  $m$  moving towards right with a constant velocity  $v$  hits another body of twice the mass moving towards left with half the velocity. If they stick together on collision, they will:  
A. come to rest  
B. move towards right  
C. move towards left  
D. can come to rest or move in any direction depending upon magnitude of masses and their velocities
- Q.43 Starting from rest, a particle travels on a circular path and the distance covered is prescribed by the relation  $s = kt^2$ ; where  $k$  is constant and  $t$  is the time. The particle then has a tangential acceleration of:  
A.  $k/2$   
B.  $k$   
C.  $2k$   
D.  $4k$
- Q.44 Consider a bar of uniform cross-section fixed at the upper end and hanging freely. The stress at any section of the bar due to its self weight is in direct proportion to:  
A.  $Y$   
B.  $y^{3/2}$   
C.  $y^2$   
D.  $1/y$
- Q.45 The state of plane stress at a point is described by  $\sigma_x = \sigma_y = \sigma$  and  $\sigma_{xy} = 0$ . The normal stress on a plane inclined at  $45^\circ$  to the  $x$ - plane will be:  
A.  $\sigma$   
B.  $\sqrt{2} \sigma$   
C.  $\sqrt{3} \sigma$   
D.  $2 \sigma$
- Q.46 A thin cylindrical shell of diameter  $d$  and wall thickness  $t$  is subjected to an internal fluid pressure  $p$ . If  $E$  is the Young's modulus and  $\mu$  is the Poisson's ratio for the cylinder material, then circumferential (diametral) strain will be:  
A.  $\frac{pd}{4tE}(2-\mu)$   
B.  $\frac{pd}{4tE}(1-2\mu)$   
C.  $\frac{pd}{4tE}(5-4\mu)$   
D.  $\frac{pd}{4tE}(4-5\mu)$
- Q.47 A cantilever beam 8 m long carries a uniformly distributed load of  $w$  N/metre run throughout its entire length. If the maximum bending moment is 32000 Nm, the rate of loading  $w$  in N/meter run is:  
A. 250  
B. 500  
C. 750  
D. 1000
- Q.48 A cantilever beam of length  $l$  carries a concentrated load at the mid of its span. If the resulting slope under the load is  $\theta$ , the slope at the free end would be:  
A.  $0.5 \theta$   
B.  $\theta$   
C.  $1.5 \theta$   
D.  $2 \theta$
- Q.49 In power transmission shafts, the polar moment of inertia of the shaft has been doubled. What torque in relation to the original torque will then be required to produce the same angle of twist?  
A. one-fourth  
B. one-half  
C. double  
D. same

- Q.50 A completely constrained motion occurs in case of:
- A. circular bar or shaft in a circular hole      B. motion of an IC engine valves  
 C. foot step bearing and roller of a vertical turbine      D. circular shaft, with collars at each end, in a circular hole
- Q.51 ABCD is a mechanism with link lengths  
 AB = 200 mm      BC = 300 mm  
 CD = 400 mm and      DA = 350 mm  
 Which one of the links should be fixed for the resulting mechanism to be a double crank mechanism?
- A. AB      B. BC  
 C. CD      D. DA
- Q.52 Klien's construction is mainly used to determine:
- A. displacement of piston      B. linear velocity and acceleration of piston  
 C. angular velocity of connecting rod      D. angular acceleration of crank
- Q.53 Given that  $T_1$  and  $T_2$  are the tensions on the tight and slack sides of the belt respectively, the initial tension of the belt taking into account centrifugal tension  $T_c$ , is equal to:
- A.  $\frac{T_1 + T_2 + T_c}{3}$       B.  $\frac{T_1 + T_2 + 2T_c}{2}$   
 C.  $\frac{T_1 + T_2 + 3T_c}{3}$       D.  $\frac{T_1 + T_2 + 4T_c}{4}$
- Q.54 Interference in an external involute spur gear can be reduced by:
- A. decreasing centre distance between gear pair      B. decreasing module  
 C. decreasing pressure angle      D. increasing number of gear teeth
- Q.55 A fixed gear having 100 teeth is in mesh with another gear having 50 teeth. The two gears are connected by an arm. The number of turns made by the smaller gear for one revolution of arm about the centre of the bigger gear is:
- A. 2/4      B. 3  
 C. 4      D. 5
- Q.56 With assumption of uniform pressure, the ratio of friction torque set up in a flat pivot bearing to that in a conical pivot bearing with cone angle  $2\alpha$  would be:
- A.  $\sin\alpha$       B.  $\cos\alpha$   
 C.  $\sin\alpha \times \cos\alpha$       D.  $\tan\alpha$
- Q.57 What is the maximum acceleration of a cam follower undergoing simple harmonic motion? where  $h$  is stroke of the follower,  $\omega$  is angular velocity of the cam,  $\phi$  is cam rotation angle for the maximum follower displacement
- A.  $\frac{h}{2} \left( \frac{\pi\omega}{\phi} \right)^2$       B.  $4h \left( \frac{\omega^2}{\phi^2} \right)$   
 C.  $4h \left( \frac{\omega^2}{\phi} \right)$       D.  $4h\pi \frac{\omega^2}{\phi^2}$
- Q.58 The whipping speed of a rotating shaft carrying a mass at the centre of its span is:
- A. more than the natural frequency of transverse vibrations  
 B. less than the natural frequency of transverse vibrations  
 C. equal to the natural frequency of transverse vibrations  
 D. is more or less depending upon the shaft stiffness
- Q.59 Austenite is a solid solution of carbon in:
- A.  $\alpha$ -iron      B.  $\beta$ -iron  
 C.  $\gamma$ -iron      D.  $\delta$ -iron

- Q.60 A reasonable amount of strength without developing internal stresses can be attained most economically by:
- A. annealing  
B. tempering  
C. normalising  
D. cyaniding
- Q.61 Heating elements and electrical resistance wires are generally made of:
- A. nichrome  
B. invar  
C. permivar  
D. white metal
- Q.62 Which of the following refractory materials is recommended for steel furnaces containing CaO slags?
- A. alumina  
B. silica  
C. magnesia  
D. fire clay
- Q.63 A double fillet welded joint with parallel fillet weld of length  $l$  and leg  $b$  is subjected to a tensile force  $p$ . Assuming uniform stress distribution, the shear stress in the weld is given by:
- A.  $\frac{\sqrt{2}P}{bl}$   
B.  $\frac{P}{2bl}$   
C.  $\frac{P}{\sqrt{2}bl}$   
D.  $\frac{2P}{bl}$
- Q.64 What type of stress is induced in the bolt when the nut is tightened by putting a washer beneath it?
- A. shear  
B. crushing  
C. tension  
D. compression
- Q.65 A square key of side  $d/4$  is to be fitted on a shaft of diameter  $d$  and in the hub of a pulley. If the material of the key and shaft is same and the two are to be equally strong in shear, what is the length of the key?
- A.  $\frac{\pi d}{2}$   
B.  $\frac{2\pi d}{3}$   
C.  $\frac{3\pi d}{4}$   
D.  $\frac{4\pi d}{5}$
- Q.66 Worm gearing is used to obtain considerable speed reduction between shafts whose axes are:
- A. perpendicular and do not intersect  
B. perpendicular and intersect  
C. inclined  
D. parallel
- Q.67 In the Lewis equation, the working stress depends upon:
- A. material of the tooth only  
B. pitch line velocity only  
C. load conditions as well material of the tooth  
D. pitch line velocity, load conditions and material of the tooth
- Q.68 The greatest twisting moment which a shaft section can resist is given by:
- A. torsional rigidity of the shaft  
B. maximum shear x polar modulus  
C. maximum shear x modulus of stress  
D. ratio of modulus of rigidity and polar moment of inertia
- Q.69 A connecting rod should be equally strong in buckling about x-axis and y-axis. For that: where  $I_{xx}$  is the moment of inertia about x-axis and  $I_{yy}$  is the moment of inertia about y-axis.
- A.  $I_{xx} = I_{yy}$   
B.  $I_{xx} = 2 I_{yy}$   
C.  $I_{xx} = 4 I_{yy}$   
D.  $I_{xx} = 8 I_{yy}$
- Q.70 Which of the following materials requires the largest shrinkage allowance while making a pattern for casting?
- A. aluminium  
B. brass  
C. cast iron  
D. plain carbon steel



- Q.81 Control chart for variables provides:
1. Basic variability of the quality characteristic
  2. Consistency of performance
  3. Number of products falling outside the tolerance limits
- Which of these statements are correct?
- |               |            |
|---------------|------------|
| A. 1, 2 and 3 | B. 1 and 2 |
| C. 2 and 3    | D. 1 and 3 |
- Q.82 For a venturimeter, the coefficient of discharge:
- |   |  |
|---|--|
| A. does not depend on the Reynolds number     | B. increases with increase in Reynolds number          |
| C. decreases with increase in Reynolds number | D. variation depends upon the range of Reynolds number |
- Q.83 Which of the following thermo-couples can measure temperature in a comparatively high range?
- |                     |                    |
|---------------------|--------------------|
| A. iron-constantan  | B. chromel-alumel  |
| C. platinum-rhodium | D. iridium-rhodium |
- Q.84 Auto-collimator is used to check:
- |              |                        |
|--------------|------------------------|
| A. roughness | B. flatness            |
| C. angle     | D. automobile balances |
- Q.85 Under what conditions, the change in the enthalpy of a system equals the heat supplied?
- |                         |   |
|-------------------------|---|
| A. constant volume      | B. constant pressure                        |
| C. constant temperature | D. standard temperature-pressure conditions |
- Q.86 A heat engine having an efficiency of 70% is used to drive a refrigerator having a coefficient of performance of 5. The energy absorbed from low temperature reservoir by the refrigerator for each kJ of energy absorbed from high temperature source by the engine is:
- |            |            |
|------------|------------|
| A. 0.14 kJ | B. 0.71 kJ |
| C. 3.5 kJ  | D. 7.1 kJ  |
- Q.87 In case of one-dimensional heat conduction in a medium with constant properties,  $T$  is the temperature at position  $x$  at time  $t$ . Then  $\frac{\partial T}{\partial t}$  is proportional to:
- |   |  |
|---|--|
| A. $\frac{T}{x}$                                | B. $\frac{\partial T}{\partial x}$     |
| C. $\frac{\partial^2 T}{\partial x \partial t}$ | D. $\frac{\partial^2 T}{\partial x^2}$ |
- Q.88 The thermal resistance for heat conduction through a hollow sphere of inner radius  $r_1$  and outer radius  $r_2$  is: (where  $k$  is the thermal conductivity of the material of sphere)
- |  |  |
|--|--|
| A. $\frac{r_2 - r_1}{4 \pi k r_2 r_1}$   | B. $\frac{(r_2 - r_1) r_1 r_2}{4 \pi k}$ |
| C. $\frac{4 \pi k (r_2 - r_1)}{r_2 r_1}$ | D. $\frac{k (r_2 - r_1)}{4 \pi r_2 r_1}$ |
- Q.89 For a perfectly black body:
- |   |                                  |
|---|----------------------------------|
| A. absorptivity $a = 1$ ,<br>reflectivity $\rho = 0$ and<br>transmissivity $\tau = 0$ | B. $\rho = 1$ and $a = \tau = 0$ |
| C. $\tau = 1$ and $a = \rho = 0$  | D. $a + \tau = 1$ and $\rho = 0$ |
- Q.90 Prandtl number is:
- A. a measure of temperature gradient at the surface
  - B. ratio of conduction to convection resistance
  - C. ratio of molecular momentum diffusivity to thermal diffusivity
  - D. mass diffused to momentum diffused

- Q.91 The sub-cooling is a process of cooling the refrigerant in vapour compression refrigeration system before:  
 A. compression B. condensation  
 C. throttling D. evaporation
- Q.92 Identify the method normally used for producing solid CO<sub>2</sub>:  
 A. simple vapour compression cycle B. vapour compression cycle with compounding of compressor  
 C. vapour absorption cycle D. pressure snow chamber method.
- Q.93 When the dry bulb and wet bulb temperature of air are same, then relative humidity of air will be:  
 A. zero per cent B. 50 per cent  
 C. 66.7 per cent D. 100 per cent
- Q.94 Mollier diagram is a plot of  
 A. temperature and entropy B. temperature and enthalpy  
 C. pressure and enthalpy D. enthalpy and entropy
- Q.95 Deaeration of feed water is done to reduce:  
 A. necessity of priming in feed pumps B. mass of water to be handled  
 C. corrosion caused by dissolved oxygen D. amount of heat required to convert water into steam
- Q.96 The amount of water evaporated from and at 100°C into dry saturated steam at atmospheric pressure is called:  
 A. evaporative capacity B. equivalent evaporation  
 C. generation factor D. boiler horse power
- Q.97 Which aspect is not true in the context of compounding of steam engines?  
 A. expansion ratio decreases B. stroke length increases  
 C. temperature range per cylinder is reduced D. uniform turning moment can be obtained by arranging the cylinders out of phase
- Q.98 Which of the following cannot be caused by a hot spark plug?  
 (1) Pre-ignition (2) Post-ignition  
 (3) Detonation (4) Run-on-ignition  
 Select the answer using the code given below:  
 A. 1 and 4 B. 2 only  
 C. 2 and 3 D. 3 only
- Q.99 The main objectives of supercharging of an IC engine are to:  
 1. reduce the weight of engine per brake power  
 2. reduce the space occupied by the engine  
 3. increase the power output of engine  
 Give the correct answer using the code given below  
 A. 1 and 2 B. 2 and 3  
 C. 1 and 3 D. 1, 2 and 3
- Q.100 The tilt of the car wheels from the vertical is called:  
 A. Castor B. Camber  
 C. slip angle D. steering axis inclination

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