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॥ आपकी सफलता, हमारी प्रतिबद्धता ॥

1. Answer D

Solution

Under the Rajasthan Public Service Guarantee Act, 2011, if the First Appellate Authority fails to provide the service within the stipulated time or if the appellant is dissatisfied with the decision, the appellant may file a second appeal with the Second Appellate Authority within 60 days. The first appeal must be filed within 30 days. This Act came into force on November 14, 2011. Provisions for a penalty exist if the service is not provided even after the hearing of the second appeal. This Act was introduced to bring transparency and accountability to the administration.

राजस्थान लोक सेवा गारंटी अधिनियम 2011 के अनुसार यदि प्रथम अपील अधिकारी तय समय में सेवा नहीं देता या निर्णय से असंतुष्टि है तो अपीलार्थी 60 दिनों के भीतर द्वितीय अपील अधिकारी को दूसरी अपील कर सकता है। प्रथम अपील 30 दिन में करनी होती है। यह अधिनियम 14 नवंबर 2011 को लागू हुआ था द्वितीय अपील की सुनवाई के बाद भी यदि सेवा नहीं मिलती तो जुर्माने का प्रावधान है। यह अधिनियम प्रशासन में पारदर्शिता और जवाबदेही लाने के लिए लाया गया था।

2. Answer A

Solution

In Rajasthan, the State Election Commission is responsible for conducting elections for Panchayati Raj institutions—such as Gram Panchayats, Panchayat Samitis, and Zila Parishads—and urban local bodies, including Municipalities, Municipal Councils, and Municipal Corporations. The Election Commission of India conducts elections only for the Lok Sabha, Legislative Assemblies, the President, and the Vice-President.

राजस्थान में पंचायती राज संस्थाओं जैसे ग्राम पंचायत, पंचायत समिति, जिला परिषद और नगरीय निकायों जैसे नगरपालिका, नगर परिषद, नगर निगम के चुनाव कराने की जिम्मेदारी राज्य निर्वाचन आयोग की होती है। भारत निर्वाचन आयोग केवल लोकसभा, विधानसभा, राष्ट्रपति और उपराष्ट्रपति के चुनाव कराता है।

3. Answer D

Solution

The Rajasthan State Election Commission was constituted on July 1, 1994. The State Election Commissioner is appointed by the Governor on the advice of the State Council of Ministers; however, it is not mandatory for the Commissioner to be a retired High Court judge—any person with administrative experience can be appointed to the post. The Commissioner's tenure is for five years or until the age of 65, whichever is earlier.

राजस्थान राज्य निर्वाचन आयोग का गठन 1 जुलाई 1994 को हुआ था राज्य निर्वाचन आयुक्त की नियुक्ति राज्यपाल द्वारा राज्य मंत्रिपरिषद की सलाह पर की जाती है, लेकिन राज्य निर्वाचन आयुक्त का उच्च न्यायालय का सेवानिवृत्त न्यायाधीश होना अनिवार्य नहीं है, यह किसी भी प्रशासनिक अनुभव वाले व्यक्ति को बनाया जा सकता है, आयुक्त का कार्यकाल 5 वर्ष या 65 वर्ष की आयु तक होता है।

4. Answer B

Solution

The Rajasthan government framed the Right to Information Rules in 2005, not in 2006. The central RTI Act was enacted in 2005.

राजस्थान सरकार ने सूचना का अधिकार नियम 2005 में बनाए थे, 2006 में नहीं। केंद्रीय RTI अधिनियम 2005 में बना

5. Answer A

Solution

Several changes were introduced under the Protection of Human Rights (Amendment) Act, 2019. These included reducing the tenure of the Chairperson and members of the State Human Rights Commission from five years to three years or until the age of 70. A provision for the re-appointment of the Chairperson and members was added, and High Court judges became eligible to serve as Chairperson. However, the provision for one Chairperson and two members already existed; this was not a new provision introduced by the 2019 amendment, as it was already part of the original 1993 Act.

मानवाधिकार संरक्षण संशोधन अधिनियम 2019 के तहत कई बदलाव किए गए। इसमें राज्य मानवाधिकार आयोग के अध्यक्ष और सदस्यों का कार्यकाल 5 साल से घटाकर 3 साल या 70 वर्ष की आयु कर दिया गया। अध्यक्ष और सदस्यों की पुनर्नियुक्ति का प्रावधान जोड़ा गया और उच्च न्यायालय का न्यायाधीश भी अध्यक्ष बनने के योग्य हो गया। लेकिन आयोग में एक अध्यक्ष और दो सदस्य का प्रावधान पहले से ही था, यह 2019 के संशोधन से संबंधित नया प्रावधान नहीं है। यह मूल अधिनियम 1993 में ही था।

6. Answer D

Solution

Under the Rajasthan Lokayukta Act, 1973, the Lokayukta can hear complaints of corruption against ministers, MLAs, Zila Pramukhs, Pradhans, Sarpanchs, District Collectors, and government employees. However, there are certain positions against which the Lokayukta cannot hear complaints; these include officers and employees of the Rajasthan Legislative Assembly Secretariat, High Court judges, the Accountant General, Election Commission officials, and judicial officers.

राजस्थान लोकायुक्त अधिनियम 1973 के अनुसार लोकायुक्त मंत्रियों, विधायकों, जिला प्रमुख, प्रधान, सरपंच, जिला कलेक्टर, सरकारी कर्मचारियों के खिलाफ भ्रष्टाचार की शिकायतें सुन सकता है। लेकिन कुछ पद ऐसे हैं जिनके खिलाफ लोकायुक्त शिकायत नहीं सुन सकता। इनमें राजस्थान विधानसभा सचिवालय के अधिकारी-कर्मचारी, उच्च न्यायालय के न्यायाधीश, महालेखाकार, चुनाव आयोग के अधिकारी और न्यायिक अधिकारी शामिल हैं।

7. Answer D

Solution

There are several schools for Patwari training in Rajasthan. These schools are located in Kota, Alwar, Tonk, Jodhpur, and Sri Ganganagar. At these schools, Patwaris receive training in revenue records, Jamabandi, maps, Girdawari, and land records.

राजस्थान में पटवारी प्रशिक्षण के लिए कई स्कूल हैं। ये स्कूल कोटा, अलवर, टोंक, जोधपुर, श्रीगंगानगर में स्थित हैं। इन स्कूलों में पटवारियों को राजस्व रिकॉर्ड, जमाबंदी, नक्शा, गिरदावरी और भू-अभिलेखों का प्रशिक्षण दिया जाता है।

8. Answer C

Solution

Shri Jai Narayan Vyas served as Chief Minister only twice, not three times: first from April 26, 1951, to March 3, 1952, and a second time from November 1, 1952, to November 12, 1954. He lost the first Legislative Assembly election in 1952 but later became Chief Minister again after winning a by-election from Kishangarh.

श्री जयनारायण व्यास मुख्यमंत्री केवल 2 बार रहे थे, 3 बार नहीं। पहली बार 26 अप्रैल 1951 से 3 मार्च 1952 और दूसरी बार 1 नवंबर 1952 से 12 नवंबर 1954 तक। वे 1952 का पहला विधानसभा चुनाव हार गए थे, बाद में किशनगढ़ से उपचुनाव जीतकर फिर मुख्यमंत्री बने।

9. Answer D

Solution

According to Article 163, there shall be a Council of Ministers in every state, headed by the Chief Minister, to aid and advise the Governor. Under Article 164(1), the Chief Minister is appointed by the Governor, and other ministers are appointed by the Governor on the advice of the Chief Minister. This article also states that the ministers hold office during the pleasure of the Governor.

अनुच्छेद 163 के अनुसार प्रत्येक राज्य में राज्यपाल को सहायता और सलाह देने के लिए एक मंत्रिपरिषद होगी जिसका मुखिया मुख्यमंत्री होगा। अनुच्छेद 164(1) के अनुसार मुख्यमंत्री की नियुक्ति राज्यपाल करेगा और अन्य मंत्रियों की नियुक्ति मुख्यमंत्री की सलाह पर राज्यपाल करेगा। इसी अनुच्छेद में कहा गया है कि मंत्री राज्यपाल के प्रसादपर्यंत अपने पद पर रहेंगे।

10. Answer C

Solution

According to Article 179 of the Constitution, the Speaker of the Legislative Assembly submits their resignation to the Deputy Speaker. Similarly, the Deputy Speaker submits their resignation to the Speaker. The Speaker can also be removed by a majority vote of the members of the Legislative Assembly.

संविधान के अनुच्छेद 179 के अनुसार विधानसभा अध्यक्ष अपना इस्तीफा विधानसभा के उपाध्यक्ष को सौंपता है। इसी प्रकार उपाध्यक्ष अपना इस्तीफा अध्यक्ष को सौंपता है। अध्यक्ष को विधानसभा के सदस्यों द्वारा बहुमत से हटाया भी जा सकता है।

11. Answer B

Solution

Laxman Singh holds the record for serving as the Leader of the Opposition in the Rajasthan Legislative Assembly four times. He belonged to the former royal family of Mewar and was associated with the Congress and, later, the BJP. Gulabchand Kataria has served as the Leader of the Opposition three times. Bhairon Singh Shekhawat served as the Leader of the Opposition twice and later became Chief Minister and Vice President. Vasundhara Raje has also served as the Leader of the Opposition twice.

राजस्थान विधानसभा में चार बार विपक्ष के नेता रहने का रिकॉर्ड लक्ष्मण सिंह का है। वे मेवाड़ के पूर्व राजपरिवार से संबंधित थे और कांग्रेस तथा बाद में भाजपा से जुड़े रहे। गुलाबचंद कटारिया तीन बार विपक्ष के नेता रहे हैं। भैरोंसिंह शेखावत दो बार विपक्ष के नेता रहे और बाद में मुख्यमंत्री और उपराष्ट्रपति बने। वसुंधरा राजे भी दो बार विपक्ष की नेता रही हैं।

12. Answer B

Solution

Article 157 (Qualifications of the Governor): He must be a citizen of India and have completed the age of 35 years.

Article 158 (Conditions of the Governor's office): He shall not be a member of Parliament or the State Legislature and shall not hold any office of profit.

अनुच्छेद 157 राज्यपाल की योग्यता वह भारत का नागरिक हो और 35 वर्ष की आयु पूरी कर चुका हो।

अनुच्छेद 158 राज्यपाल की शर्तें वह संसद या राज्य विधानमंडल का सदस्य नहीं होगा और कोई लाभ का पद धारण नहीं करेगा।

13. Answer C

Solution

The 73rd Constitutional Amendment Act of 1992 introduced both mandatory and optional provisions for Panchayati Raj. Mandatory provisions include the constitution of the Gram Sabha, direct elections at all three levels, a five-year term, the holding of by-elections within six months, reservation, and the establishment of State Election Commissions and Finance Commissions. However, the decision on whether the election of the Sarpanch should be direct or indirect was left to the states; this constitutes an optional provision.

73वें संविधान संशोधन 1992 में पंचायती राज के लिए अनिवार्य और ऐच्छिक प्रावधान किए गए। अनिवार्य प्रावधानों में ग्रामसभा का गठन, तीनों स्तरों पर प्रत्यक्ष चुनाव, 5 साल का कार्यकाल, 6 माह में उपचुनाव, आरक्षण, राज्य निर्वाचन आयोग और वित्त आयोग का गठन शामिल है। लेकिन सरपंच का चुनाव प्रत्यक्ष होगा या अप्रत्यक्ष यह राज्य पर छोड़ा गया है, यह ऐच्छिक प्रावधान है।

14. Answer B

Solution

The Ashok Mehta Committee recommended a two-tier system for Panchayati Raj in 1977. The committee stated that the three-tier system had failed and proposed that the Zila Parishad and Mandal Panchayat should constitute the two tiers. The Balwant Rai Mehta Committee (1957) had recommended a three-tier system, which was subsequently implemented. The G.V.K. Rao Committee (1985) advocated for strengthening the Zila Parishad, while the L.M. Singhvi Committee (1986) recommended granting constitutional status to Panchayati Raj.

पंचायती राज में द्विस्तरीय व्यवस्था की सिफारिश अशोक मेहता समिति ने 1977 में की थी। इस समिति ने कहा था कि त्रिस्तरीय व्यवस्था असफल हो गई है इसलिए जिला परिषद और मंडल पंचायत दो स्तर होने चाहिए। बलवंत राय मेहता समिति 1957 ने त्रिस्तरीय व्यवस्था की सिफारिश की थी जिसे लागू किया गया। जी.वी.के. राव समिति 1985 ने जिला परिषद को मजबूत करने की बात कही और एल.एम. सिंहवी समिति 1986 ने पंचायती राज को संवैधानिक दर्जा देने की सिफारिश की।

15. Answer D

Solution

243(ZC) - Non-application of provisions regarding urban bodies to certain areas

243(ZD) - Committee for district planning

243(ZC) - नगरीय निकायों के प्रावधानों का कुछ क्षेत्रों में लागू न होना

243(ZD) - जिला योजना के लिए समिति

16. Answer A

Solution

The Ganeshwar civilization is situated on the banks of the Kantli River in the Sikar district. It is a Copper Age civilization and is considered a center of the Copper Age. It was discovered in 1977 by Ratan Chandra Agrawal and Vijay Kumar. गणेश्वर सभ्यता सीकर जिले में कांतली नदी के किनारे स्थित है। यह ताम्रयुगीन सभ्यता है और इसे तांबा युग का केंद्र माना जाता है। इसकी खोज 1977 में रतनचंद्र अग्रवाल और विजय कुमार ने की थी

17. Answer A

Solution

Carlyle discovered megalithic sites in 1871-72 that were found in Dausa, Machedi, and Bharatpur. These are known as 'megalithic burial sites'.

कार्लाइल ने 1871-72 में मेगालिथिक स्थल खोज निकाले थे जो दौसा, माचेडी और भरतपुर में मिलते थे। इन्हें 'मेगालिथिक समाधि स्थल' कहा जाता है।

18. Answer D

Solution

The Shivi Janapada was located in the Chittorgarh and Udaipur region; the Bikaner region was known as Jangal Desh, and the Alwar and Bharatpur region as Matsya Desh. The Abu and Sirohi region was called Arbud Desh, while Jalore was known as Swarnagiri and Jabalipur.

शिवि जनपद चित्तौड़गढ़ और उदयपुर क्षेत्र में था जांगल देश बीकानेर क्षेत्र को कहा जाता था मत्स्य देश अलवर और भरतपुर क्षेत्र को कहा जाता था। अर्बुद देश आबू और सिरोही क्षेत्र को कहा जाता था, जालौर को स्वर्णगिरि और जाबालिपुर कहा जाता था।

19. Answer D

Solution

Dhumraj was the progenitor of the Paramara dynasty of Abu. The kingdom of the Paramara ruler Dharanivaraha was known as 'Navakoti Marwar'. Lahini Devi, the daughter of the Paramara ruler Dhandhuk, had the Saraswati Baori (stepwell) in Vasantgarh (Sirohi) renovated; this is mentioned in the Vasantgarh inscription.

आबू के परमार वंश का आदिपुरुष धूमराज था। परमार शासक धरणीवराह का राज्य नवकोटी मारवाड़ कहा जाता था। परमार शासक धंधुक की बेटी लाहिनी देवी ने बसंतगढ़ (सिरोही) में सरस्वती बावड़ी का जीर्णोद्धार करवाया था। बसंतगढ़ शिलालेख में इसका उल्लेख है।

20. Answer D

Solution

Surat Singh (1787-1828), the ruler of Bikaner, gave the Karni Mata Temple in Deshnok its current magnificent form; the temple's dome and marble work were executed during his reign.

Rai Singh (1571-1611), a prominent Mansabdar of Akbar and the ruler of Bikaner, was himself a great scholar. He wrote a commentary titled "Balbodhini" on the astrological text "Jyotish Ratnamala," designed to explain astrology to children.

Karn Singh (1631-1669), the ruler of Bikaner, was known as "Jangaldhar Badshah." He was also a scholar and authored a treatise titled "Sahitya Kalpadrum" (also referred to as "Sahitya Ratna Drum" in some books).

बीकानेर के शासक सूरत सिंह (1787-1828) ने देशनोक स्थित करणी माता मंदिर को वर्तमान भव्य स्वरूप दिया था। मंदिर का गुंबद और संगमरमर का कार्य उन्हीं के काल में हुआ।

अकबर के प्रमुख मनसबदार और बीकानेर शासक राय सिंह (1571-1611) स्वयं बड़े विद्वान थे। उन्होंने ज्योतिष ग्रंथ "ज्योतिष रत्नमाला" पर "बालबोधिनी" नामक टीका लिखी थी, जो बच्चों को ज्योतिष समझाने के लिए थी।

बीकानेर शासक कर्ण सिंह (1631-1669) को "जांगलधर बादशाह" कहा जाता था। वे भी विद्वान थे और उन्होंने "साहित्य कल्पद्रुम" नामक ग्रंथ की रचना की थी। कुछ किताबों में इसे "साहित्य रत्न दुम" भी लिखा मिलता है।

21. Answer A

Solution

Shiluka, a ruler of the Mandore branch of the Pratiharas, wrested the chhatra (royal parasol) from Devraj Bhatti, the Bhati king of Valla (Jaisalmer). This event dates back to the 8th century and is mentioned in the Ghatiyala inscription. Shiluka was a powerful ruler of the Pratihara dynasty who had established Mandore as his capital.

प्रतिहारों की मंडोर शाखा के शासक शीलूक ने वल्ल (जैसलमेर) के भाटी राजा देवराज भट्टी से उसका छत्र छीन लिया था। यह घटना 8वीं शताब्दी की है। घटियाला शिलालेख में इस घटना का उल्लेख है। शीलूक प्रतिहार वंश का शक्तिशाली शासक था जिसने मंडोर को अपनी राजधानी बनाया था।

22. Answer B

Solution

A treaty was concluded between Maharana Jai Singh of Mewar and Aurangzeb in 1681. Aurangzeb had imposed the Jizya tax on Mewar. In exchange for the Jizya, Maharana Jai Singh ceded three parganas—Pur, Mandal, and Badnor—to Aurangzeb.

मेवाड़ महाराणा जयसिंह और औरंगजेब के बीच 1681 में संधि हुई थी। औरंगजेब ने मेवाड़ पर जजिया कर लगाया था। जजिया के बदले महाराणा जयसिंह ने औरंगजेब को पुर, मांडल और बदनौर ये तीन परगने दिए थे।

23. Answer B

Solution

The Chhatra of Patta is located near Rampol, not Surajpol. The Tulja Bhavani Temple is situated at Surajpol. Patta and Jaimal defended Chittor during Akbar's invasion.

पत्ता की छतरी सूरजपोल पर नहीं बल्कि रामपोल के पास स्थित है। सूरजपोल पर तुलजा भवानी मंदिर है। पत्ता और जयमल ने अकबर के आक्रमण के समय चित्तौड़ की रक्षा की थी।

24. Answer C

Solution

Jai Singh, the ruler of Alwar, declared Hindi the official language of Alwar in the 1920s. He banned child marriage and mismatched marriages in 1909. He commissioned the construction of the Sariska Palace, which is now located within the Sariska Tiger Reserve. However, he participated only in the First Round Table Conference (1930) and not in the Second Round Table Conference (1931).

अलवर के शासक जयसिंह ने 1920 के दशक में हिंदी को अलवर की राजभाषा घोषित किया था। उन्होंने 1909 में बाल विवाह और अनमेल विवाह पर रोक लगाई थी। उन्होंने सरिस्का महल का निर्माण करवाया था जो अब सरिस्का टाइगर रिजर्व में है। लेकिन उन्होंने केवल प्रथम गोलमेज सम्मेलन 1930 में भाग लिया था, दूसरे गोलमेज सम्मेलन 1931 में नहीं।

25. Answer B

Solution

Akbar appointed Bhagwant Das of Amer as the Subahdar of Punjab, not Bihar.

अकबर ने आमेर के भगवंतदास को बिहार का नहीं बल्कि पंजाब का सूबेदार बनाया था।

26. Answer A

Solution

Event/War	Exact date	Description
Battle of Bithoda	September 8, 1857	It was fought between Thakur Kushal Singh of Auwa and the combined forces of the British Army and Jodhpur State, in which the revolutionaries won.
Battle of Chelawas	September 18, 1857	It is also known as the 'Black and White War'. In this, the revolutionaries defeated the army of AGG Patrick Lawrence and beheaded the Political Agent Mock Mason and hanged him on the Auwa Fort.
Battle of Auwa	January 20, 1858	The British army under the leadership of Colonel Holmes took control of the fort of Auwa after a fierce battle.
Battle of Kuada	August 9, 1858	A battle took place between the army of British General

		Roberts and Tatya Tope on the banks of the Kothari River in Bhilwara district, in which Tatya Tope was defeated.
Battle of Rakmgarh	August, 1858	This clash with British forces occurred just after the Battle of Kuada during Tatya Tope's visit to Rajasthan.

घटना / युद्ध	सटीक तिथि	विवरण
बिथोड़ा का युद्ध (Battle of Bithoda)	8 सितंबर, 1857	आऊवा के ठाकुर कुशल सिंह और ब्रिटिश सेना तथा जोधपुर राज्य की संयुक्त सेना के बीच लड़ा गया, जिसमें क्रांतिकारियों की जीत हुई।
चेलावास का युद्ध (Battle of Chelawas)	18 सितंबर, 1857	इसे 'काले-गोरों का युद्ध' भी कहा जाता है। इसमें क्रांतिकारियों ने ए.जी.जी. पैट्रिक लॉरेंस की सेना को हराया और पॉलिटिकल एजेंट मॉक मेसन का सिर काटकर आऊवा के किले पर लटका दिया था।
आऊवा का युद्ध (Battle of Auwa)	20 जनवरी, 1858	कर्नल होम्स के नेतृत्व में ब्रिटिश सेना ने भारी संघर्ष के बाद आऊवा के किले पर नियंत्रण कर लिया था।
कुआड़ा का युद्ध (Battle of Kuada)	9 अगस्त, 1858	भीलवाड़ा जिले में कोठारी नदी के किनारे ब्रिटिश जनरल रॉबर्ट्स और तात्या टोपे की सेना के बीच युद्ध हुआ, जिसमें तात्या टोपे की पराजय हुई।
रकमगढ़ का युद्ध (Battle of Rakmgarh)	अगस्त, 1858	तात्या टोपे की राजस्थान यात्रा के दौरान ब्रिटिश सेनाओं के साथ यह टकराव कुआड़ा के युद्ध के ठीक बाद घटित हुआ था।

27. Answer C

Solution

Manikyalal Verma established the Khandlai Ashram in Sagwara (Dungarpur) in 1934 for the education of the Bhil community. Manikyalal Verma was a renowned freedom fighter and social reformer from Rajasthan. He founded this ashram to spread education and awareness among the Bhils.

भील शिक्षा के लिए खांदलाई आश्रम की स्थापना माणिक्यलाल वर्मा ने 1934 में सागवाड़ा (डूंगरपुर) में की थी। माणिक्यलाल वर्मा राजस्थान के प्रसिद्ध स्वतंत्रता सेनानी और समाज सुधारक थे। उन्होंने भीलों में शिक्षा और जागरूकता फैलाने के लिए इस आश्रम की स्थापना की थी।

28. Answer A

Solution

The Lasodia movement was initiated by Saint Mavji. He was renowned for his efforts towards social reform among the Bhil communities of Mewar, Vagad, and the surrounding regions. He preached to the Bhils, urging them to abandon substance abuse, superstition, and social evils. He was born in Dungarpur.

लसोड़िया आंदोलन का सूत्रपात संत मावजी ने किया था। वे मेवाड़, वागड़ और पास के क्षेत्रों के भीलों में सामाजिक सुधार के लिए प्रसिद्ध थे। उन्होंने भीलों में नशा, अंधविश्वास और सामाजिक कुरीतियों को छोड़ने का उपदेश दिया। उनका जन्म डूंगरपुर में हुआ था।

29. Answer A

Solution

Mewar → Narayani Devi

Bharatpur → Dharmavati

Bikaner → Rukma Devi

Marwar → Suraj Devi

मेवाड़ → नारायणी देवी

भरतपुर → धर्मवती

बीकानेर → रुक्मा देवी

मारवाड़ → सूरज देवी

30. Answer D

Solution

Bundi Prajamandal (Bundi): 1931 (established by Kantilal)

Bikaner Prajamandal (Bikaner): 1936 (established by Magharam Vaidya)

Banswara Prajamandal (Banswara): 1943 (established by Bhupendra Nath Trivedi)

Jhalawar Prajamandal (Jhalawar): 1946 (established by Mangilal Bhavya)

बूंदी प्रजामण्डल (Bundi): 1931 (कान्तिलाल द्वारा स्थापित)

बीकानेर प्रजामण्डल (Bikaner): 1936 (मघाराम वैद्य द्वारा स्थापित)

बांसवाड़ा प्रजामण्डल (Banswara): 1943 (भूपेन्द्र नाथ त्रिवेदी द्वारा स्थापित)

झालावाड़ प्रजामण्डल (Jhalawar): 1946 (मांगीलाल भव्य द्वारा स्थापित)

31. Answer B

Solution

Statement A is true: due to British pressure, the Mewar administration reached an agreement regarding the Bijolia movement in 1922, and several demands of the farmers were accepted under this agreement. Reason R is also true: the Jagirdar of Bijolia refused to abide by the spirit of the 1922 agreement and resumed harassing the farmers. However, Reason R is not the correct explanation for Statement A; they are distinct events. Therefore, both A and R are correct, but R does not explain A.

कथन A सत्य है कि ब्रिटिश दबाव के कारण मेवाड़ प्रशासन ने 1922 में बिजोलिया आंदोलन से समझौता किया था। इस समझौते में किसानों की कई मांगें मान ली गई थीं। कारण R भी सत्य है कि बिजोलिया के जागीरदार ने 1922 के समझौते की भावना को मानने से इनकार कर दिया और किसानों को फिर से परेशान करना शुरू कर दिया। लेकिन कारण R, कथन A की सही व्याख्या नहीं है, दोनों अलग-अलग घटनाएं हैं। इसलिए A और R दोनों सही हैं पर R, A की व्याख्या नहीं है।

32. Answer C

Solution

A farmers' meeting was organized at Dabi in Bundi district in 1923. Nanak Bhil was hoisting the flag at this gathering. On the orders of Bundi Superintendent of Police Ikram Hussain, he was shot, resulting in his martyrdom. This incident is known as the Dabi massacre.

1923 में बूंदी जिले के डाबी में किसान सभा का आयोजन किया गया था। इस सभा में नानक भील झंडा फहरा रहे थे। बूंदी पुलिस अधीक्षक इक़राम हुसैन के आदेश से उन पर गोली चलाई गई जिससे नानक भील शहीद हो गए। इसे डाबी हत्याकांड कहा जाता है

33. Answer A

Solution

The fourth phase of the integration of Rajasthan took place on March 30, 1949. During this phase, the princely states of Jaipur, Jodhpur, Bikaner, and Jaisalmer were merged to form 'Brihad Rajasthan' (Greater Rajasthan). Jaipur was designated as its capital, and Maharaja Man Singh II was appointed as the Rajpramukh.

राजस्थान एकीकरण का चतुर्थ चरण 30 मार्च 1949 को हुआ था। इसी चरण में जयपुर, जोधपुर, बीकानेर और जैसलमेर रियासतों का विलय हुआ और बृहद राजस्थान का निर्माण हुआ। इसकी राजधानी जयपुर बनाई गई। महाराजा मानसिंह द्वितीय को राजप्रमुख बनाया गया था।

34. Answer B

Solution

First Phase - Matsya Union (18 March 1948) - Alwar

Second Phase - Rajasthan Union (25 March 1948) - Kota

Third Phase - United Rajasthan (18 April 1948) - Udaipur

Fourth Phase - Greater Rajasthan (30 March 1949) - Jaipur

Fifth Phase - United Greater Rajasthan (15 May 1949)

Sixth Phase - Rajasthan Union (26 January 1950)

Seventh Phase - Present-day Rajasthan (1 November 1956)

प्रथम चरण - मत्स्य संघ (18 मार्च 1948) - अलवर

दूसरा चरण - राजस्थान संघ (25 मार्च 1948) - कोटा

तीसरा चरण - संयुक्त राजस्थान (18 अप्रैल 1948) - उदयपुर

चौथा चरण - बृहद राजस्थान (30 मार्च, 1949) - जयपुर

पांचवा चरण - संयुक्त बृहद राजस्थान (15 मई, 1949)

छठा चरण - राजस्थान संघ (26 जनवरी, 1950)

सातवां चरण - वर्तमान राजस्थान (1 नवम्बर 1956)

35. Answer D

Solution

The Shekhawati Brigade was established in 1835 with the aim of maintaining peace and order in the Shekhawati region. Its headquarters was located in Jhunjhunu. While the British justified the brigade's necessity by citing the presence of bandits and robbers in the area, its actual objective was to control trade routes in Shekhawati and expand British influence in Rajputana. It was the first brigade of British India.

शेखावाटी में शांति और व्यवस्था बनाए रखने के नाम पर शेखावाटी ब्रिगेड की स्थापना 1835 में की गई थी। इसका मुख्यालय झुंझुनूं में रखा गया था। अंग्रेजों ने कहा था कि शेखावाटी में डाकू और लुटेरे हैं इसलिए शांति के लिए ब्रिगेड जरूरी है लेकिन इसका असली उद्देश्य शेखावाटी के व्यापारिक मार्गों पर नियंत्रण करना और राजपूताना में अंग्रेजी प्रभाव बढ़ाना था। यह ब्रिटिश भारत की पहली ब्रिगेड थी।

36. Answer A

Solution

During the Revolt of 1857, most rulers of Rajasthan assisted the British. Maharaja Sardar Singh of Bikaner provided the most significant aid to the British and personally traveled as far as Punjab. Takht Singh of Jodhpur and Ram Singh II of Jaipur also supplied troops and funds to the British. However, Maharao Ram Singh of Bundi did not assist the British during the revolt and remained neutral.

1857 के विद्रोह में राजस्थान के अधिकांश शासकों ने अंग्रेजों की मदद की थी। बीकानेर के महाराजा सरदार सिंह ने अंग्रेजों को सबसे अधिक मदद की और खुद पंजाब तक गए। जोधपुर के तख्त सिंह और जयपुर के रामसिंह द्वितीय ने भी अंग्रेजों को सेना और धन दिया। लेकिन बूंदी के महाराव रामसिंह ने 1857 के विद्रोह में अंग्रेजों की कोई सहायता नहीं की और तटस्थ बने रहे।

37. Answer A

Solution

Rawal Shiv Singh of Samod sided with the rebels. He expressed loyalty to the Mughal Emperor and offered a nazar (tribute). However, Maharaja Ram Singh II of Jaipur rejected his proposal to align with the Mughal Emperor.

सामोद के रावल शिवसिंह ने विद्रोहियों का पक्ष लिया। उसने मुगल बादशाह के प्रति निष्ठा व्यक्त की तथा नजर भेंट की। परन्तु जयपुर के महाराजा रामसिंह द्वितीय ने उनकी मुगल बादशाह के प्रति मैत्री के सुझाव को अस्वीकार कर दिया।

38. Answer B

Solution

Major Shaitan Singh, renowned as the 'Hero of Banasur', was born on September 1, 1924, in the village of Banasur in the Phalodi district (formerly Jodhpur). He initially enlisted in the Jodhpur State Forces. Following the merger of the Jodhpur princely state with India, he was transferred to the Kumaon Regiment. On November 17, 1962, when China attacked the Chushul post in the Ladakh region, the responsibility for defending the post rested with Major Shaitan Singh's 'Charlie Company'. He was martyred while fighting there on November 18, 1962. Notably, he was posthumously awarded the Param Vir Chakra.

'बाणासुर का शहीद' के नाम से विख्यात मेजर शैतान सिंह का जन्म 1 सितम्बर, 1924 को फलौदी जिले (पूर्व जोधपुर) के बाणासुर गाँव में हुआ। वे जोधपुर राज्य सेना में भर्ती हुए। जोधपुर रियासत के भारत में विलय के बाद उन्हें कुमाऊँ रेजिमेंट में स्थानान्तरित कर दिया गया। 17 नवम्बर, 1962 को जब चीन ने लद्दाख क्षेत्र की चुशूल चौकी पर आक्रमण किया, उस समय इस चौकी की रक्षा की जिम्मेदारी मेजर शैतानसिंह की 'चारली कम्पनी' पर थी। यहाँ लड़ते हुए 18 नवम्बर, 1962 को शहीद हो गये। ज्ञातव्य है कि इन्हें मरणोपरान्त परमवीर चक्र से सम्मानित किया गया।

39. Answer A

Solution

Rajasthan Seva Sangh, Wardha (1919 AD): In 1919, Vijay Singh 'Pathik', Ramnarayan Chaudhary, and Haribhai Kinkar met Gandhiji in Wardha. Inspired by Gandhiji, the 'Rajasthan Seva Sangh' was established in Wardha in 1919. Its objective was to foster cordial relations between the jagirdars (feudal lords) and their subjects. The members were guided by the motto: "I shall never waver from my duty out of fear for my life; the work shall endure, whether my life remains or not." In October 1920, the Rajasthan Seva Sangh was relocated from Wardha to Ajmer. Its aim was to provide momentum to the ongoing movements within the princely states of Rajasthan. This organization played a pivotal role in spreading political consciousness across Rajasthan. Through this Sangh, the weekly newspaper 'Rajasthan Kesari' was published from Wardha, followed later by the publication of 'Navin Rajasthan' from Ajmer.

राजस्थान सेवा संघ, वर्धा (1919 ई.) : 1919 ई. में विजयसिंह पथिक, रामनारायण चौधरी और हरिभाई किंकर वर्धा में गाँधी जी से मिले। गाँधीजी से मिली प्रेरणा के फलस्वरूप वर्धा में 1919 ई. में 'राजस्थान सेवा संघ' की स्थापना की गयी। इसका उद्देश्य जागीरदारों तथा उनकी प्रजा में परस्पर मैत्री-संबंध स्थापित करना था। इसके सदस्यों का ध्येय था- 'जान के खौफ से कर्तव्य से न हटूंगा कभी, काम रह जाएगा, जान रहे न रहे।' अक्टूबर, 1920 में राजस्थान सेवा संघ को वर्धा से स्थानांतरित कर अजमेर में स्थापित किया गया। उसका उद्देश्य राजस्थान की रियासतों के चलने वाले आन्दोलनों को गति देना था। इस संघ के माध्यम से राजस्थान में राजनीतिक चेतना का प्रसार हुआ। इस संघ द्वारा वर्धा से 'राजस्थान केसरी' साप्ताहिक और बाद में अजमेर से 'नवीन राजस्थान' प्रकाशित किया गया।

40. Answer D

olution

Marwar Seva Sangh, Jodhpur - It was established in Jodhpur in 1920 AD by Jai Narayan Vyas and Chandmal Surana. Durga Shankar served as its president, while Prayag Raj Bhandari was the secretary. Its members included Jai Narayan Vyas, Bhanwarlal Sarraf, Kanmal, and Girdhari Lal, among others. Its objective was to foster political awareness among the people of Marwar and to oppose the arbitrary and unjust actions of state officials.

मारवाड़ सेवा संघ, जोधपुर - 1920 ई. में जोधपुर में इसकी स्थापना जयनारायण व्यास एवं चाँदमल सुराणा द्वारा की गई। इसके अध्यक्ष दुर्गाशंकर तथा मंत्री प्रयागराज भण्डारी थे। जयनारायण व्यास, भँवरलाल सर्राफ, कानमल व गिरधारी लाल आदि इसके सदस्य थे। इसका उद्देश्य मारवाड़ की जनता में राजनैतिक जागृति उत्पन्न करना तथा राज्याधिकारियों की मनमानी व अन्यायपूर्ण गतिविधियों का विरोध करना था।

41. Answer A

Solution

- A. Single lane road - 3.75 m
- B. Two lane road without kerbs - 7.0 m
- C. Two lane road with raised kerbs - 7.5 m
- D. Multi-lane pavement - 3.5 m per lane

42. Answer B

Solution

As interval is constant = 30 m

Area by trapezoidal rule,

$$A = 30 \left[\frac{0 + 5.8}{2} + 2.65 + 3.8 + 3.75 + 4.65 + 3.6 + 5 \right]$$

$$A = 790.5 \text{ m}^2$$

43. Answer C

Solution

As per IRC 73 : 2023, clause 6.4 -

Maximum permissible super elevation on not snow bound hilly terrain - 0.10 (10%)

44. Answer A

Solution

Assertion (A) is true: By definition, contour lines connect points of equal elevation. Under normal circumstances, ground terrain is continuous and doesn't overlap, so two different contour lines cannot merge or cross. The only exceptions are an overhanging cliff or a cave, where a single vertical viewpoint projects multiple overlapping elevations onto a 2D map.

Reason (R) is true: If two distinct contour lines (representing two different elevations) were to intersect at a normal point on a map, it would imply that a single physical point on Earth's surface simultaneously possesses two different heights above sea level. This is physically impossible for standard topography.

45. Answer C

Solution

Given:

Gradient of hill road = 6%

Horizontal curve radius = 300 m

Compensated gradient?

$$(i) \text{ Grade compensation} = \frac{30 + R}{R} = \frac{30 + 300}{300} = 1.1\%$$

$$(ii) \text{ Grade compensation} = \frac{75}{R} = \frac{75}{300} = 0.25$$

Compensated gradient = 6 - 0.25 = 5.75 %

46. Answer C

Solution

Height of instrument = R.L of B.M + 1.324

= 100 + 1.324

= 101.324 m

R.L of bottom side of chajja = 101.324 + 2.4

= 103.724 m

47. Answer D

Solution

Reaction time $t = 3$ sec

Skid distance $S = 10$ m

$V = u - at$

$u = at$

$$S = ut - \frac{1}{2}at^2$$

$$s = at^2 - \frac{1}{2}at^2$$

$$s = \frac{1}{2}at^2$$

$$10 = \frac{1}{2} \times a \times 3^2$$

$$\frac{20}{9} = a$$

$$a = 2.22 \text{ m/sec}$$

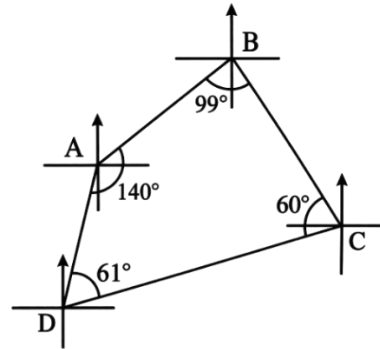
$$a = f \cdot g$$

$$\frac{2.22}{9.81} = f$$

$$f = 0.23$$

48. Answer D

Solution



Bearing of AD = Bearing of BA + $140^\circ - 180^\circ$

$$= (180^\circ + 60^\circ) + 140^\circ - 180^\circ = 200^\circ$$

$$\text{Bearing of DC} = \text{Bearing of AD} + 61^\circ - 180^\circ = 200^\circ + 61^\circ - 180^\circ = 81^\circ$$

$$\text{Bearing of CD} = \text{Bearing of DC} + 180^\circ = 261^\circ$$

49. Answer D

Solution

Given

NH two lane

OSD = 200 m

(i) Minimum length of overtaking zones = 3 (OSD)

$$= 3 \times 200 = 600 \text{ m}$$

(ii) Desirable length of overtaking zone

$$= 5 \times \text{OSD}$$

$$= 5 \times 200 = 1000 \text{ m}$$

50. Answer D

Solution

Five fundamental lines (axis) of a theodolite

(i) Vertical axis

(ii) Horizontal axis

(iii) Line of collimation

(iv) Altitude level axis

(v) Plate level axis

51. Answer B

Solution

Given

$$\text{Centrifugal ratio} = \frac{P}{W} = 0.2$$

Width of vehicle $b = 2.4$ m

Height of vehicle $h = 2.4$ m

Super elevation $e = \text{zero}$

(i) To avoid over turning

$$\frac{b}{2h} > \frac{P}{W}$$

$$= \frac{2.4}{2 \times 2.4} > 0.2$$

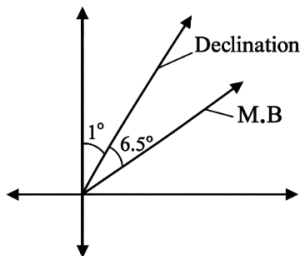
$$= 0.5 > 0.2$$

Safe in overturning

52. Answer A

Solution

In old map



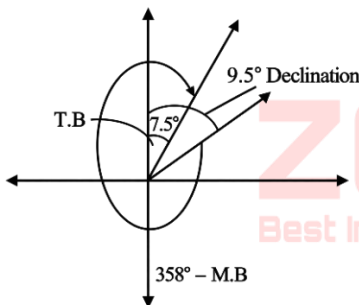
True bearing = Magnetic Bearing + declination

$$= 6.5^\circ + 1^\circ$$

$$\text{True bearing} = 7.5^\circ$$

Now,

In New map



$$M.B = 360^\circ - \text{declination} + T.B$$

$$= 360^\circ - 9.5^\circ + 7.5^\circ$$

$$= 358^\circ$$

53. Answer C

Solution

Mechanical widening - $(\text{wheel base})^2 / 2R$

Total widening of road - $(V / 9.5\sqrt{R}) + (l^2 / 2R)$

Radius of curve exceeding 300 m - No widening

Psychological widening - $V / (9.5\sqrt{R})$

54. Answer A

Solution

In prismatic compass, the graduations are in WCB system, having 0° at south, 90° at west, 180° at North and 270° at East. And the graduations are engraved inverted.

Statement III is FALSE: A counterweight (or sliding rider) is attached to the magnetic needle to counteract magnetic dip (vertical tilt due to Earth's magnetic lines), not magnetic declination.

55. Answer C

Solution

$$\text{Turning angle} = 45^\circ$$

$$\text{Tractive force} = T (1 - \cos \theta)$$

$$\text{Curve resistance} = T (1 - \cos \theta)$$

$$= T (1 - \cos (45^\circ))$$

$$= 0.293 T$$

56. Answer C

Solution

$$1 \text{ cm} : 10 \text{ m}$$

$$\text{Scale } 1 : 1000$$

$$s = 1000$$

$$\text{Displacement of field} = l \sin \alpha$$

$$\text{Displacement on the paper} = \frac{l \sin \alpha}{s}$$

$$0.25 = \frac{l \times \sin(3)}{1000}$$

$$l = \frac{0.25 \times 1000}{\sin(3)}$$

$$l = 4777 \text{ mm}$$

$$l = 4.77 \text{ m}$$

57. Answer A

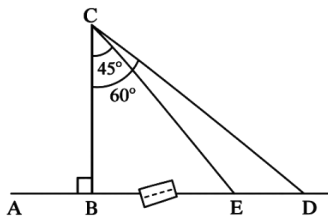
Solution

Assertion (A) is true: A transition curve is introduced between a straight alignment and a circular curve to gradually introduce centrifugal force. To ensure a smooth comfort level, the curvature must increase at a uniform rate. Consequently, the rate of increase of curvature must match the rate of increase of super-elevation so that the inner edge or center line can be raised proportionally.

Reason (R) is true: The fundamental purpose of fixing the length of a transition curve is to ensure that the full super-elevation required for the circular curve is attained exactly at the point where the transition curve ends and the circular curve begins (the tangent to spiral / spiral to curve points).

58. Answer B

Solution



$$\angle ABC = 90^\circ$$

$$BE = BC \tan 45^\circ$$

$$BE = 200 \text{ m}$$

59. Answer C

Solution

The Indian Roads Congress (IRC) strictly recommends the spiral (or clothoid) as the ideal transition curve for the horizontal alignment of highways.

This is because its radius decreases linearly as the curve length increases (LR constant), which keeps the rate of change of centrifugal acceleration completely constant.

60. Answer C

Solution

Bad ranging - Cumulative (+)

Error in reading tape - Mistake

Greater tape lengths - Cumulative (-ve)

Careless holding of staff - Compensating (+ or -)

61. Answer A

Solution

Assertion (A) is true: In highway engineering, a square parabola (quadratic parabola) is widely preferred and recommended for vertical curves over a circular curve.

Reason (R) is true: The primary reason for this preference is that a parabola provides a constant rate of change of grade, which ensures a smooth and comfortable transition for vehicles moving from one gradient to another.

62. Answer A

Solution

Geodetic Surveying: This type of surveying is carried out over large areas where the curvature of the earth is taken into consideration to achieve high precision.

Plane Surveying: This is the type of surveying where the earth's curvature is neglected, which is appropriate only for small areas.

63. Answer A

Solution

(i) 30/40 Grade is less soft than $\frac{80}{100}$

grade bitumen

(ii) Tie bars provided across longitudinal joints.

64. Answer C

Solution

1. Hillock (Statement 1: Correct)

Ranging is obstructed because you cannot see over or through a hill to align points directly.

Chaining is possible because you can physically measure the distance over the slope using stepping or reciprocal methods. Thus, it is an obstacle to ranging but not chaining.

2. River (Statement 2: Incorrect)

Ranging is possible because you have a clear line of sight across the water to align points on the opposite bank.

Chaining is obstructed because you cannot directly walk across with a chain. The statement incorrectly reverses this definition.

3. Building (Statement 3: Correct)

Both ranging and chaining are obstructed because a building completely blocks your line of sight and prevents you from measuring a direct path through it.

65. Answer D

Solution

The cement concrete pavement is a rigid pavement and slab has tensile strength, tensile stresses are developed due to the bending of the slab under wheel load and temperature variations.

66. Answer d

Solution

Statement i is incorrect: Horizontal equivalent is the horizontal distance between two consecutive contour lines. It varies depending on the slope of the ground (closer together for steep slopes, farther apart for gentle slopes). It is not always constant.

Statement ii is correct: For a vertical cliff, contour lines coincide or run into each other at a single point or line on the map, making the horizontal equivalent between them zero.

Statement iii is correct: Contour interval is inversely proportional to the scale of the map. A large-scale map (detailed) uses a small contour interval, while a small-scale map uses a large contour interval to avoid clutter.

Statement iv is incorrect: For detailed design work, a small contour interval is preferred to obtain precise elevation data.

67. Answer B

Solution

Given:

Spot speeds: 40,50,60,70,72 (m/s)

(i) Time mean speed (V_t)

$$V_t = \frac{V_1 + V_2 + V_3 + \dots + V_n}{n}$$

$$= \frac{40 + 50 + 60 + 70 + 72}{5}$$

$$= 58.4 \text{ m/s}$$

(ii) Space mean speed (V_s)

$$V_s = \frac{n}{\frac{1}{V_1} + \frac{1}{V_2} + \frac{1}{V_3} + \dots + \frac{1}{V_n}}$$

$$= \frac{5}{\frac{1}{40} + \frac{1}{50} + \frac{1}{60} + \frac{1}{70} + \frac{1}{72}}$$

$$V_s = 55.65 \text{ m/s}$$

68. Answer d

Solution

Indirect Methods of contouring:

1. Tachometric method (Used for hilly areas)
2. Grid method (Used for small, low-undulating areas)
3. Cross-section method (Used for long, narrow strips of land like roads or railways)

69. Answer A

Solution

(Traffic volume < 3000 vehicles/hour): Correct. According to Indian Roads Congress (IRC) guidelines, a traffic rotary operates at its highest efficiency when the total volume of vehicles entering from all intersecting roads is between 500 and 3000 vehicles per hour. When traffic

exceeds 3000 vehicles per hour, rotaries often face severe congestion, making signalized intersections a better choice.

(Total right turning traffic is very high): Correct. Rotaries are ideally suited for intersections where a substantial percentage of traffic turns right (typically exceeding 30% of the total intersecting volume). This layout handles right-turning traffic seamlessly without forcing vehicles to stop, eliminating the complex signal phases required at typical signalized intersections

70. Answer C

Solution

Statement A: Incorrect.

The Transit Rule is employed for balancing a traverse when angular measurements are more precise than linear measurements (often the case in theodolite traversing). Since the statement asserts that angular measurements are less precise, it is false.

Statement B: Incorrect.

Bowditch's Method (Compass Rule) is based on the assumption that errors in linear measurements (e_l) are directly proportional to the square root of the length of the line ($e_l \propto \sqrt{l}$), while errors in angular measurements are inversely proportional to the square root of the length ($e_a \propto \frac{1}{\sqrt{l}}$). Since the statement claims that

1 Vi linear errors are inversely proportional, it is false.

71. Answer D

Solution

Cross-fall (also known as camber or cross slope) refers to the transverse slope provided from the center of the road toward its outer edges

72. Answer C

Solution

Statement A is CORRECT: A total station integrates an electronic transit theodolite with an electronic distance meter (EDM). It uses built-in computerized software to calculate and directly display measurements like slope distances, horizontal distances, and coordinates.

Statement B is CORRECT: One of the primary functions of a total station is to electronically measure and display both vertical and horizontal angles.

Statement C is INCORRECT: A total station is highly superior and vastly more useful, precise, and efficient for land surveys compared to traditional measuring tapes.

73. Answer B

Solution

1. Local Street : Primarily provides access to residential and commercial properties. They have the lowest speeds and narrowest widths.
2. Collector Street : Collects traffic from local streets and channels it to arterial roads. They are wider than local streets but narrower than sub-arterials.
3. Sub-Arterial Road : Acts as a secondary highway network, carrying moderate-to-high volumes of through traffic across cities.
4. Arterial Road : Continuous routes designed for high-speed, heavy-volume traffic moving across major regions of a city. They have the largest right-of-way and lane widths.

74. Answer C

Solution

Statement I (Correct): A check line (also known as a proof line) is a line run in the field specifically to verify the accuracy of the triangular framework. It is measured after the framework lines are surveyed to ensure that the fieldwork contains no significant errors.

Statement II (Correct): The base line is the most important and longest survey line in chain surveying. It generally runs right through the center or middle of the area to be surveyed, serving as the main reference line from which all other triangles and measurements are built.

75. Answer A

Solution

1. Regulatory Signs (also called Mandatory Signs): These signs inform road users of specific laws, regulations, and prohibitions. Violating these signs is a legal offense. "No

Parking" and "No Stopping" fall directly under this category because they strictly prohibit an action. They are typically circular in shape.

2. Warning Signs (or Cautionary Signs): These are meant to alert drivers about impending hazards or road conditions ahead (e.g., sharp curves, narrow bridges). They are triangular in shape.
3. Informatory Signs (or Guide Signs): These provide directions, distances, and information about roadside facilities (e.g., hospitals, petrol pumps, public parking areas). They are rectangular in shape.
4. Compulsory Direction Signs: While these exist, they are actually a sub-classification within the Regulatory Sign category itself, dictating mandatory maneuvers like "Turn Left Only."

76. Answer A

Solution

Statement I is correct: Simpson's one-third rule assumes that the boundary between three consecutive ordinates is a parabolic arc (a second-degree polynomial curve).

Statement II is incorrect: The assumption that the figures are trapezoids belongs to the trapezoidal rule, where boundaries between ordinates are joined by straight lines. The mid-ordinate rule assumes that the area is divided into a series of rectangles with heights equal to the mid-ordinates.

77. Answer D

Solution

This is a hybrid pattern combining the radial nature of the star system and the intersecting grid network.

Radial roads provide long-distance connectivity, while the grid allows for local traffic distribution. Offers a balanced approach for connectivity and traffic management.

Introduced in Nagpur: The Nagpur road plan (1943) is the first attempt at planned road development in India, incorporating elements of both star and grid patterns.

78. Answer B

Solution

Statement i is correct: In rigid pavements, providing a high-quality base/sub-base course acts as a filter layer that prevents fine subgrade particles from mixing with water and being ejected through joints under heavy wheel loads (mud-pumping).

Statement ii is correct: A thick sub-base layer protects the frost-susceptible subgrade layer underneath by acting as an insulation barrier against frost action and heaving.

Statement iv is correct: In flexible pavements, the main function of the granular base and sub-base layers is to distribute the wheel load over a wider area, reducing the stress reaching the weaker subgrade layer.

79. Answer C

Solution

Foresight : Taken on the change point from the old instrument position before shifting the instrument.

Backsight : Taken on the same change point from the new instrument position after shifting the instrument.

80. Answer B

Solution

Statement A is Correct: A prime coat uses low-viscosity liquid bitumen applied directly to an absorbent, untreated granular base (like a gravel or crushed stone base course). Its purpose is to penetrate the surface, plug capillary voids, bond loose particles, and prepare it for the next layer.

Statement B is Correct: A tack coat is a very thin, sticky application of liquid bitumen applied to an existing paved surface (either old asphalt or concrete). Its sole purpose is to create a strong adhesive bond between the old pavement layer and the new overlying bituminous layer to prevent slippage.

81. Answer D

Solution

Calculations for Each Item

P. $144^{\circ} 30'$ Quadrant II)

QB = $180^{\circ} - 144^{\circ} 30' = 35^{\circ} 30' \rightarrow S 35^{\circ} 30' E (4)$

Q. $215^{\circ} 30'$ Quadrant III)

QB = $215^{\circ} 30' - 180^{\circ} = 35^{\circ} 30' \rightarrow S 35^{\circ} 30' W 3)$

R. $125^{\circ} 30'$ Quadrant II)

QB = $180^{\circ} - 125^{\circ} 30' = 54^{\circ} 30' \rightarrow S 54^{\circ} 30' E 1)$

S. $0.324^{\circ} 30'$ Quadrant IV)

QB = $360^{\circ} - 324^{\circ} 30' = 35^{\circ} 30' \rightarrow N 35^{\circ} 30' W 2)$

82. Answer D

Solution

Statement A is true:

Flexible pavements transfer wheel loads down through aggregate layers.

This load distribution occurs via grain-to-grain contact points.

The stress decreases with depth as it spreads out.

Statement B is false:

Flexible pavements possess negligible flexural strength.

They flex and deform directly under wheel loads.

In contrast, rigid pavements possess high flexural strength.

83. Answer C

Solution

A. Ductility test R. Standard briquette mould

The ductility of bitumen is measured by the distance to which it will elongate before breaking when a specimen is pulled apart at a specified speed and temperature. The specimen is prepared using a standard briquette mould.

B. Flash and Fire point test S. Pensky-Martens closed test

The Pensky-Martens closed tester is a standard laboratory apparatus used to determine the flash and fire points of petroleum products, including bitumen.

C. Softening test P. Ring and Ball test

The Ring and Ball apparatus is specifically used to determine the softening point of bitumen, which indicates the temperature at which the material attains a particular degree of softening.

D. Penetration test Q. Penetrometer

A penetrometer is used to measure the consistency or hardness of bituminous materials by determining the distance a standard needle penetrates vertically into the sample under known conditions of loading, time, and temperature.

84. Answer C

Solution

Crab and Drift matches with 3. Aerial photogrammetry: These terms refer to the effects of crosswinds on an aircraft during flight, where drift is the lateral deviation from the planned flight line and crab is the angular rotation of the aircraft to counteract this wind.

Stadia intercept matches with 4. Tachometric survey: The stadia intercept is the difference between the upper and lower staff readings on a leveling rod, used to calculate distances mathematically in tachometry.

Culmination and elongation match with 2.

Astronomical survey: These terms relate to observations of celestial bodies; culmination is when a star crosses the observer's meridian, and elongation is when a star reaches its maximum eastern or western angular deviation.

Baseline measurement matches with 1.

Triangulation: A baseline is a precisely measured line on the ground that serves as the foundation for calculating all other triangle sides in a triangulation framework.

85. Answer A

Solution

A traffic rotary is justified when

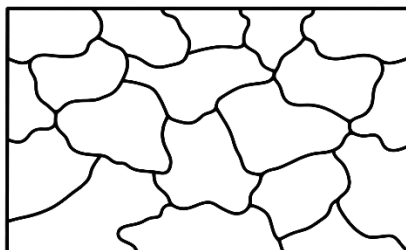
(i) Number of intersecting road is between 4 and 7

(ii) When large space is available

(iii) Traffic volume is greater than 500 veh/hr but less than 5000 veh/hr

86. Answer D

Solution



Alligator cracking

Above figure shows general pattern of alligator cracking of the bituminous surface. This type of failure occurs due to repeated application of heavy wheel loads resulting fatigue or due to relative movement of pavement layer material.

87. Answer D

Solution

The perpendicular offset y at any distance x measured along the tangent line from the starting point of a cubic parabola transition curve is given by:

$$y = \frac{x^3}{6RL}$$

Where:

L = Total length of the transition curve

R = Radius of the circular curve

At the junction point where the transition curve meets the circular curve, the distance x becomes equal to the total length of the transition curve.

$$y_{\text{junction}} = \frac{L^3}{6RL} = \frac{L^2}{6R}$$

The lateral shift (S) introduced to accommodate the transition curve is mathematically defined as:

$$S = \frac{L^2}{24R}$$

Hence

$$y_{\text{junction}} = 4 \times \left(\frac{L^2}{24R} \right) = 4 \times S$$

88. Answer C

Solution

1. Metal box → b. Protective casing against dust:

The cylindrical metallic box protects the internal components of the compass from dust, moisture, and damage.

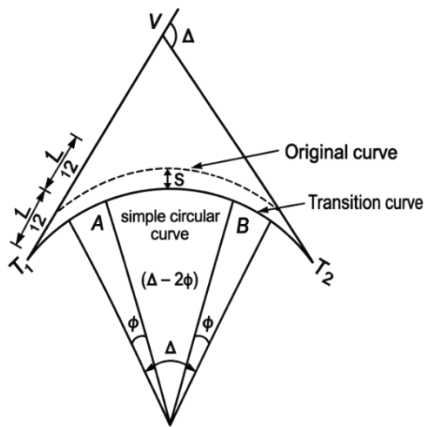
2. Pivot c. Centrally located part: The pivot is fixed vertically at the center of the box to support the magnetic needle.

3. Lifting pin d. Provided right below the sight vane: The lifting pin is located beneath the sight vane; pressing or folding the sight vane activates it to lift the needle off the pivot to prevent wear and tear.

4. Magnetic needle a. Heart of the compass: The magnetic needle aligns with the magnetic meridian and is the core functional element (heart) of the compass.

89. Answer B

Solution



First tangent length

$$V_{T1} = \frac{L}{2} + (R + S) \tan \frac{\Delta}{2}$$

Hence option (b) is correct

90. Answer A

Solution

The one with the larger R.F. is the larger scale.

(a) 1 cm = 40 m

$$R.F. = \frac{1 \text{ cm}}{40 \text{ m}} = \frac{1 \text{ cm}}{40 \times 100 \text{ cm}} = \frac{1}{4000}$$

(b) R.F. = $\frac{1}{50000}$

(c) 1 cm 50 km

$$R.F. = \frac{1 \text{ cm}}{50 \text{ km}} = \frac{1 \text{ cm}}{50 \times 1000 \times 100 \text{ cm}} = \frac{1}{5000000}$$

(d) R.F. = $\frac{1}{300000}$

Therefore, the largest scale = $\frac{1}{4000}$

91. Answer A

Solution

Given: E= 25 MPa, P = 40 kN, P = 0.6 MPa

For flexible plate,

$$\Delta = 1.5 \frac{P_a}{E_s} \times F_2$$

$F_2 = 1$, when test is performed on subgrade

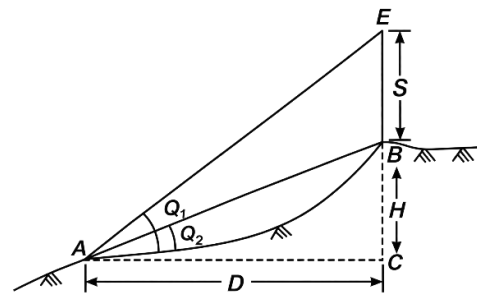
$$\Delta = \frac{1.5 \times p \times \sqrt{\frac{P}{\pi p}}}{E_s}$$

$$\Delta = \frac{1.5 \times 0.6 \times \sqrt{\frac{40 \times 10^3}{\pi \times 0.6}}}{25}$$

= 5.24 mm

92. Answer A

Solution



$$\text{In } \triangle ACE, \tan \theta_1 = \frac{S + H}{D}$$

In $\triangle ACB$,

$$\tan \theta_2 = \frac{H}{D}$$

$$\Rightarrow H = \tan \theta_2 D$$

From (i), we get

$$D \tan \theta_1 = S + \tan \theta_2 D$$

$$D (\tan \theta_1 - \tan \theta_2) = S$$

$$D = \frac{S}{\tan \theta_1 - \tan \theta_2}$$

93. Answer B

Solution

$$V^2 = u^2 + 2as$$

$$V = 0$$

$$a = -\mu g$$

$$u^2 = 2\mu g s$$

$$(13.89)^2 = 2 \times \mu g \times 18$$

$$\mu = 0.54$$

Braking efficiency,

$$\eta\% = \frac{\mu}{\mu_{\text{avg}}} \times 100 = \frac{0.54}{0.75} \times 100 = 72.83\%$$

94. Answer A

Solution

If the vertical circle verniers do not read zero when the line of sight is horizontal, the vertical angle measured will be in correct. The error is known as the index error and this can be eliminated by taking both face observations or by applying index correction.

The error is introduced when the zeros of the vernier are not at the ends of the same diameter. Thus, the difference between the two vernier readings will not be 180° , but there will be a constant difference of other than 180° . The error can be eliminated by reading both the vernier and taking the mean of the two.

Hence option (a) is correct.

95. Answer C

Solution

$$\text{CBR} = \frac{\text{Load sustained by sample}}{\text{Load sustained by standard rock}} \\ = \frac{120}{2055} \times 100 = 5.84\%$$

96. Answer C

Solution

In plane table surveying, the accuracy or reliability with which the position of an instrument station is established is called the Strength of Fix.

It is particularly important in the three-point problem, where the position of the plane table station is determined by resection.

97. Answer C

Solution

$$R_{\min} = \frac{V^2}{g(f + e_{\max})} = \frac{(0.278 \times 60)^2}{9.81 \times (0.22)} \\ = 128.91 \text{ m} \approx 130 \text{ m}$$

98. Answer C

Solution

Benkelman beam measures the deflection of flexible pavements under the action of moving wheel loads.

99. Answer A

Solution

Cadastral survey is used to plot the details such as boundaries of fields, houses and property lines in rural and urban areas. These are also known as public land surveys.

Photogrammetry is used to produce a mosaic or map by compiling the photographs.

Aerial survey covers photogrammetry and photo-interpretation both.

100. Answer D

Solution

Check available for levelling are:

(i) $\sum B.S - \sum F.S = \text{Last R.L} - \text{First RL}$

(ii) $\sum \text{Rise} - \sum \text{Fall} = \text{Last RL} - \text{First RL}$

(iii) $\sum B.S - \sum F.S = \sum \text{Rise} - \sum \text{Fall}$

Hence option (d) is correct.

101. Answer D

Solution

As per IRC, the height of the obstruction/ stationary object for non-passing sight distance is taken as 0.15 m i.e. 15 cm.

102. Answer C

Solution

A substance bar is manufactured by Mr. Kern. The length of the substance bar is 2 m (6 ft.). It is used for the measurement of comparatively short horizontal distance in undulating areas. A substance bar may be used as a substance base, the length of the bar is made equal to the distance between two target.

103. Answer B

Solution

For Roads (Highways): The maximum allowable value is taken as 1/4 (or 0.25). This aligns with the typical limiting value of the side friction factor that prevents a road vehicle from skidding laterally.

For Railways: The maximum value is more strictly limited to 1/8 or 0.125). This lower limit is necessary because of the rigid nature of steel wheels on rails and the high demand for passenger comfort inside trains.

104. Answer D

Solution

Horizontal distance of the staff from the vertical axis of instrument is given by

$$D = kS + C$$

where k = multiplying constant

$$= \frac{f}{i}$$

C = Additive constant

$$= (f + d)$$

Where, f = focal length of objective

i = stadia interval

d = distance between the objective lens and axis of theodolite

105. Answer B

Solution

Circumpolar star is a star that never sets below the horizon for a given latitude.

Colatitude is the distance from the pole to the horizon.

For a star to never set, its distance from the pole must be smaller than the colatitude.

Therefore, its declination (height from the equator) must be more than the colatitude

106. Answer A

Solution

- A. Diverging: Represents a single traffic stream splitting into two separate directions.
- B. Merging: Represents two separate traffic streams joining together to form a single stream.
- C. Crossing: Represents two traffic streams intersecting each other directly, typically at an angle or perpendicularly.
- D. Weaving: Represents the movement where a merging stream and a diverging stream cross paths over a specific length of a roadway.

107. Answer B

Solution

Telescopic Alidade: It is specifically designed for plane table surveying. Equipped with a telescope and stadia hairs, it allows the surveyor to compute both horizontal and vertical distances directly without using a separate chain or tape, alongside taking inclined lines of sight.

Simple Alidade: This instrument only contains sight vanes (slits) and can only be used to sight objects and draw lines of sight. It cannot measure distances or vertical elevations directly.

Tacheometer: While a tacheometer also measures horizontal and vertical distances using stadia systems, it is a separate transit-theodolite instrument used in tacheometric surveying, not a direct plane tabling accessory.

Clinometer: A clinometer is used strictly for measuring angles of slope, elevation, or depression, rather than direct distance measurement.

108. Answer C

Solution

Flexible Progressive System (Most Efficient): In this computerized system, the cycle length, cycle splits, and time schedule at each intersection can be automatically varied based on real-time traffic volume. It is highly adaptive, reduces overall delay, and provides the maximum traffic-handling capacity.

Simultaneous System: All signals along a route

show the same indication (e.g., all green or all red) at the same time. This forces frequent stops and is generally inefficient.

Alternate System: Successive signals along a route

show opposite colors simultaneously. It works adequately only if intersections are uniformly spaced and traffic speeds remain completely constant.

Simple Progressive System: Signals are scheduled to display green phases at a fixed, predetermined time sequence along the road to maintain a constant vehicle speed, but it lacks the real-time flexibility to adjust to changing peak hours.

109. Answer A

Solution

Spatial resolution : This refers specifically to the size of the smallest possible feature or area on the Earth's surface that can be detected and distinguished as a distinct entity by a sensor. Higher spatial resolution means smaller cell or pixel sizes, allowing for greater detail to be observed.

Radiometric resolution : This describes the ability of a sensor to discriminate very slight differences in electromagnetic energy or signal strength

Spectral resolution : This refers to the ability of a sensor to define fine wavelength intervals. A higher spectral resolution means the sensor can distinguish between more narrow bands of the electromagnetic spectrum.

Temporal resolution : This refers to the revisit time or frequency with which a satellite sensor captures imagery of a particular area on the Earth's surface.

110. Answer D

Solution

For 600 m with 1 cm = 30 m

the measured length on plan = 20 cm

with 1 cm = 50 m,

True length = 20 x 50 m = 1000 m

111. Answer C

Solution

The corners of a concrete slab are completely free to expand and contract. Because there is no restraint against the subgrade at the corners, frictional stress is always zero

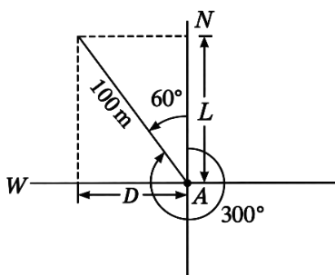
At night, the slab corners warp upward (leaving them unsupported). When a heavy wheel load acts on this unsupported corner, both load stress and warping stress cause maximum tension at the top fiber.

Therefore,

Critical Corner Stress = Load Stress + Warping Stress

112. Answer C

Solution



Whole circle bearing $WCB = 360^\circ - 60^\circ - 300^\circ$

Latitude = $L \cos \theta = 100 \cos 300^\circ$

= +50 m

Departure = $L \sin \theta = 100 \sin 300^\circ$

= - 86.6 m

113. Answer A

Solution

Assertion (A) is true: In plane table surveying.

Lehman's method (a trial-and-error method) is one of the most accurate and widely used approaches to solve the three-point problem. It relies entirely on a set of rules known as Lehman's rules to find the true position of the instrument station.

Reason (R) is true: Lehman's rules provide a systematic, controlled technique to estimate the position of the true point from the triangle of error. By applying these rules iteratively, the size of the triangle reduces until it converges to a single point.

Correct Explanation: Since these rules describe the mechanism of how the trial-and-error procedure functions to solve the three-point problem, Relation (R) is the correct explanation of Assertion (A).

114. Answer A

Solution

Synthetic Aperture Radar (SAR) is an active remote sensing technology that creates high-resolution images by using the motion of the radar antenna over a target region to simulate a much larger physical antenna (aperture). This allows it to bypass the physical size limitations of standard radar systems and capture fine details regardless of weather conditions or daylight.

115. Answer D

Solution

The orbital speed of the geostationary satellite around the earth is same as the rotation speed of the Earth. Hence, it is stationary with respect to Earth.

116. Answer A

Solution

A masonry or reinforced concrete wall that constitutes the end support of bridges or similar structures by which it joins the bank of the waterway is called an abutment.

117. Answer A

Solution

Resection is specifically used to determine the unknown position of the station occupied by the plane table by taking sights toward points of known, already plotted locations.

Radiation locates surrounding points by drawing rays from a single known station.

Intersection fixes the position of an object by intersecting rays drawn from two or more different stations.

Orientation is the process of keeping the table parallel to its previous position at a former station.

118. Answer D

Solution

A wing wall is a retaining wall located at the ends of a bridge abutment or culvert. Its primary purpose is to retain the earth or soil of the approach embankment and protect it from erosion.

In bridge engineering, the top width of wing walls and return walls is designed to withstand structural loads and provide proper retention of the embankment approaches. According to standard specifications (such as the IRC: SP :13-2022 guidelines), the minimum top width of wing walls and returns must not be less than 450 mm (45 cm).

119. Answer C

Solution

Clinometer → A clinometer is a surveying instrument used to measure angles of slope, elevation, or depression.

Prism square → A prism square is

used in surveying to set out right angles and establish perpendicular offsets from a base line. Planimeter → A planimeter is a mechanical instrument used to measure the area of an irregular two-dimensional shape on a map or drawing.

Pentagraph (Pantograph) → A pantograph (often spelled pentagraph in older text) is a mechanical linkage used to enlarge or reduce drawings and maps.

120. Answer C

Solution

Flying bridge: A light, elevated walkway or a temporary military structure built to cross an obstacle quickly.

Floating bridge: A roadway supported by buoyant pontoons or rafts resting directly on the water's surface.

Suspension bridge: A permanent bridge where the roadway hangs below large, curved overhead cables secured by towers.

Boat bridge: A type of floating bridge that uses a series of anchored boats placed side by side to support the road.

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